VOL. LXXXIII PART EIGHT

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

AUGUST 1958

PAGE

The Secretary's Page 317

Notes from Wisley. By N. K. GOULD 320

The Making of a Devon Garden. By L. S. FORTESCUE. *Illustrated* 323

Propagation of Woody Plants by Cuttings. By R. J. GARNER. *Illustrated* 335

Some Tulips at the Keukenhof Exhibition. By BRAM WARNAAR. *Illustrated* 343

Pukeiti as it is Today. By DOUGLAS ELLIOTT. *Illustrated* . 349

Ornamental and Uncommon Plants for Gardens of the Côte d'Azur. By J. MARNIER-LAPOSTOLLE. *Illustrated* . 354

Some Begonias at Chelsea Flower Show, 1958. By L. MAURICE MASON. *Illustrated* 357

NOTE FROM A FELLOW:
Pink Meconopsis 358

Plants and Problems—XLV 360

UNIV. LIBRARY
2 AUG 1958
READING

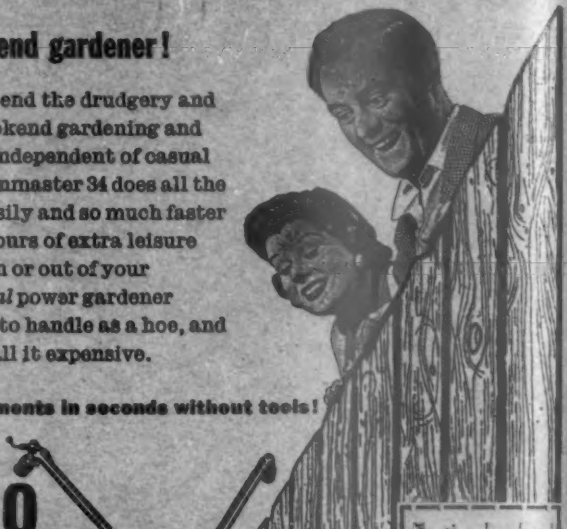
VINCENT SQUARE, LONDON, S.W.1

Now–a smaller
low-priced
GARDENMASTER

for the weekend gardener!

At last you can end the drudgery and backache of weekend gardening and make yourself independent of casual help. The Gardenmaster 34 does all the hard work so easily and so much faster that you gain hours of extra leisure for enjoyment in or out of your garden. It's a *real* power gardener but it's as light to handle as a hoe, and nobody could call it expensive.

Change Attachments in seconds without tools!



£37.10.0

with cultivating head and spinweeder. Lawn mowing and Hedge Trimming attachments extra.

Gardenmaster 80, for heavier duty and with more powerful engine, **£49.0.0**

Hire Purchase Terms Available

IT DIGS–WEEDS
–HOES–TRIMS HEDGES
–AND IT'S A LAWN MOWER, TOO!

WRITE FOR DETAILS

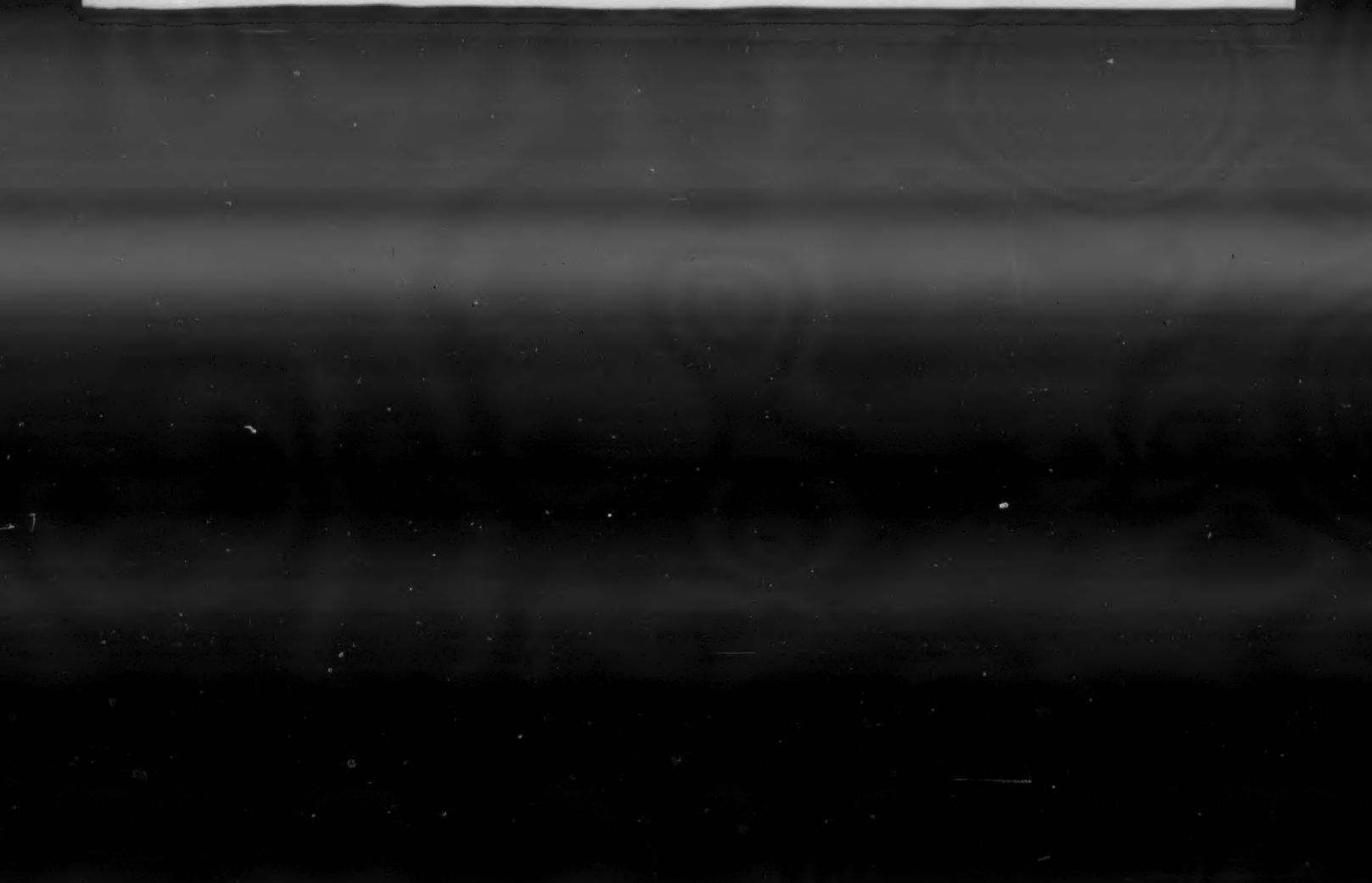
LANDMASTER, TUCKNALL, NOTTINGHAM
Please send me illustrated folders on Gardenmaster machines B.H.J.

NAME .....

ADDRESS .....

Made by Landmaster Ltd.
A MEMBER OF THE FIRTH CLEVELAND GROUP

CEC 190



JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

VOL. LXXXIII PART EIGHT

August 1958

THE SECRETARY'S PAGE

ANNOUNCEMENTS—AUGUST AND SEPTEMBER

Shows

TUESDAY, August 12 12 NOON to 6 P.M. WEDNESDAY, August 13 10 A.M. to 5 P.M.	Fortnightly Flower Show, in the New Hall. Gladiolus Competition and British Fuchsia Society's Competition, in the Old Hall.
TUESDAY, September 2 12 NOON to 6 P.M. WEDNESDAY, September 3 10 A.M. to 5 P.M.	Fortnightly Flower Show and Alpine Garden Society's Competition, in the Old Hall.
FRIDAY, September 5 1 P.M. to 7.30 P.M. SATURDAY, September 6 10 A.M. to 5 P.M.	National Dahlia Society's Show, in both Halls.
TUESDAY, September 9 11 A.M. to 7 P.M. WEDNESDAY, September 10 10 A.M. to 5 P.M.	National Rose Society's Show, in both Halls.
TUESDAY, September 16 12 NOON to 6 P.M. WEDNESDAY, September 17 10 A.M. to 5 P.M.	Fortnightly Flower Show, Cactus and Succulent Society's Competition and Hardy Plant Society's Competition, in the New Hall.
FRIDAY, September 19 1 P.M. to 7.30 P.M. SATURDAY, September 20 10 A.M. to 6 P.M.	National Chrysanthemum Society's Show, in both Halls.

Shows—*continued*

TUESDAY, September 30
12 NOON to 6 P.M.
WEDNESDAY, October 1
10 A.M. to 6 P.M.
THURSDAY, October 2
10 A.M. to 5 P.M.
} Great Autumn Show, in both Halls.

Lectures

TUESDAY, August 12, at 3 P.M. "The use of Residual Herbicides in the Garden and Nursery", by MR. P. BRACEY.

TUESDAY, September 2, at 3 P.M. "House Plants", by MR. T. ROCHFORD.

TUESDAY, September 16, at 3 P.M. "Outdoor Plants worth growing for their Foliage", by MR. G. S. THOMAS.

TUESDAY, September 30, at 3 P.M. "Some Recent Improvements in Crop Cultivation and Management", by MR. G. D. LOCKIE, N.D.H.

Demonstration at Wisley—On September 24 there will be a demonstration on Digging, Manuring and Composting at Wisley, commencing at 2 P.M. The demonstration will be repeated at the same time on September 25.

Medal for Long Service in Horticulture—At the last Annual General Meeting the President said that the Council was considering the question whether some recognition should not be made to some of those men and women who have spent the whole of their lives in one garden, nursery or other horticultural establishment. It has now been decided to institute a medal for award to any man or woman of British nationality, resident in the United Kingdom, who has completed not less than forty years satisfactory and continuous employment as a gardener or in some other horticultural capacity in a private, commercial, public or botanical garden, nursery, market garden, fruit plantation or seed trial-ground with *one* employer or family or in *one* place. The recipient of a medal will also receive a buttonhole badge and a certificate recording the award. On completion of fifty years satisfactory service an employee will be eligible for a bar. Horticultural employment broken only by (*a*) war or national service, and/or (*b*) absence for a limited period (e.g. for the period of a student-gardener's course at Kew) will be regarded as continuous horticultural employment. The award may be made to a retired employee but not posthumously.

Anyone desiring to make application for this Long-Service Medal should do so on a form which may be obtained from the Secretary.

Chelsea Show, 1959—It may be helpful for Fellows to know that in 1959 the Chelsea Show will be held on May 27, 28 and 29. The Private View for Fellows and Associates will be on May 26.

Joint Chrysanthemum and Dahlia Committee Meetings at Southport—The Joint Chrysanthemum Committee and the Joint Dahlia Committee will meet at Southport Flower Show on Wednesday, August 27, to consider new varieties submitted to them. Exhibits intended for inspection by either of these committees must be entered with the Secretary of the Committee concerned and staged on the afternoon of Tuesday, August 26, or before 8 A.M. on Wednesday, August 27. Entry forms may be obtained from the Secretary of The Royal Horticultural Society beforehand, or from the Secretary of the Committee concerned at the Show on Tuesday, August 26, or before 8 A.M. on Wednesday, August 27.

The Registration of Lily Names—At the Fifteenth International Horticultural Congress held at Nice, France, in April 1958, The Royal Horticultural Society was appointed the International Registration Authority for Lily Names. The chief duties of an International Registration Authority are (*a*) to compile, maintain and publish an international register of names, (*b*) to register names which conform to the International Code of Nomenclature for Cultivated Plants, and (*c*) to persuade raisers, introducers and others concerned with the distribution of plants to use only names which conform to the Code.

In order to avoid the confusion which must inevitably arise if new lilies are named without regard to names already in use, anyone who is contemplating naming a lily is asked to inquire whether the proposed name is already in use for a lily.

The Society's Examinations

General Examination Results 1958—At the General Examination in Horticulture, held on March 12, 1958, there were 829 candidates, of whom 459 were successful—42 being placed in Division I and 417 in Division II. 370 candidates failed to satisfy the Examiners.

At the General Examination in Horticulture for Juniors (those under 18 years of age on March 1, 1958), which was also held on March 12, 1958, there were 266 candidates, of whom 119 were successful. 147 candidates failed.

Both these Examinations consisted of written work only.

The General Examination in Horticulture in 1959 will be held on Friday, March 13. The General Examination in Horticulture for Juniors is now discontinued.

The Preliminary Examination for the National Diploma in Horticulture will be held on Saturday, November 22, 1958. The closing date for entry is October 1, 1958.

Publications—The attention of Fellows is drawn to the leaflet and order form enclosed, and particularly to the new Penguin Volume on *Roses*, by F. FAIRBROTHER, which has recently been published in collaboration with The Royal Horticultural Society and is the first of a Series of such books.

NOTES FROM WISLEY

N. K. Gould

DURING this month the most colourful features of the Gardens will be the terrace bedding, the herbaceous borders, the annual border and the floral trials.

Zonal pelargoniums form the basis of this year's bedding scheme. Most of the varieties employed have fancy foliage, and among these, two types may be distinguished. In the first of these the leaf develops zones of yellow, red or bronze which contrast effectively with the green parts. Here belongs 'Mrs. Henry Cox' in which green is splashed irregularly over the creamy ground-colour and overlaid with a strong red zone. Where red and green overlap a deep purplish-bronze area is formed. Quite frequently half, or the whole of a leaf is devoid of chlorophyll, then exhibiting a vivid red and cream combination. 'Harry Hieover' has bronze and green leaf and a brilliant scarlet flower. The second of the two foliage types has a green leaf margined with white. 'Caroline Schmidt' is a vigorous, red-flowered variety of this type. 'Little Dorrit', a dwarf of extremely bushy habit, is useful as an edging or as ground-cover in a bed of standards of other varieties. It does not normally flower, but it will do so occasionally on a vigorous freak shoot.

These fancy pelargoniums, much inclined to erratic sporting, are mostly examples of periclinal chimaeras, in which the cell-layers of the leaf vary in the degree of their green pigmentation. These curious plants have engaged the attention of botanists for a very long time, and the literature contains many references to them. The late PROFESSOR F. E. WEISS chose as his subject for the Masters Memorial Lectures in 1940, "Graft Hybrids and Chimaeras", and gave a clear explanation of these phenomena, which is to be found in the R.H.S. JOURNAL, Vol. 65, pp. 237–43.

The semi-double vermilion 'Gustav Emich' and other green-leaved varieties are also used here in the form of bush plants grown from last summer's cuttings, and standards produced by taking up a single strong stem to the required height and then allowing lateral growths to develop in the appropriate positions. The pale coloured heliotrope 'Madame de Bussy' is also grown in the form of standards, while the compact, dark-coloured 'Princess Marina' and the rather more vigorous 'Chatsworth Park' are kept as dwarf plants.

The herbaceous borders to the south of the terrace continue to display many fine plants, and we may draw attention to a few of those less frequently encountered in private gardens. *Malva alcea fastigiata* has tall, erect stems well clothed with five-lobed leaves and bearing a long succession of rose-pink mallow flowers in the leaf-axils. It requires no special soil or treatment, and it can be raised from seed without difficulty. *Stokesia laevis*, the only species of a North American genus of *Compositae*,

is a most valuable plant for the front of the border, as its rather lax stems do not greatly exceed a foot in height. It is a variable plant, and several named forms, differing in season of flowering, and in colour, have been grown. The flowers may be light violet, lavender or white, but never blue, although they are so described in many books. A worthy plant with flowers much nearer blue (approximately the same blue as those of *Gentiana asclepiadea*) is *Salvia ambigens*, which has slender, erect stems a yard high, good foliage and few-flowered whorls of tubular blooms. Its season continues until ended by frost.

The perennial species of Sunflower are rather numerous and puzzling, and the wide-spreading habit of some greatly detracts from their value. One of the easiest to recognize is *Helianthus mollis*, which makes a rather bushy plant 4 feet or so tall. The ovate, stem-clasping leaves are covered with velvety down which gives them a greyish tone; the flowers are rather light yellow. The Japanese *Sanguisorba obtusa* makes no great splash of colour, but its short cylindrical spikes of rose-purple florets rising from the basal clump of light green pinnate leaves, are quite effective. *Scabiosa rumelica* is an uncommon perennial species of medium height and spreading habit, and its flower-heads are of a warm shade of ruby-red often seen in the annual Sweet Scabious.

Those who like variegated plants should note *Scrophularia nodosa variegata*, which has stiffly upright, four-angled stems from which spread broad cream-blotched and margined leaves. It is hard to believe that such a dreary plant as the wild type of the species could be transformed by the accident of variegation into anything so handsome. Perhaps the most vivid occupant of these borders in late summer is the Mexican *Lobelia fulgens*, whose bronze-tinted leaves, ornamental all through the season, now harmonize agreeably with the intense red of the long spires of flower. This and its garden varieties are almost invariably described as *L. cardinalis*, the name of a species native to the Southern U.S.A., which first came into cultivation here in the seventeenth century. The Mexican plant arrived in this country a good deal later and is at present much more widely grown. It is the finer plant of the two, having a larger flower with broader corolla-lobes.

Two white-flowered Composites of the "everlasting" type, *Anaphalis margaritacea* and *A. triplinervis*, display for several weeks flattish clusters of pearly-white flower-heads not unlike the "Immortelles" which, dyed in various colours, have been used in floristry a good deal on the Continent. Finally, we may mention a dwarf form of *Physostegia virginiana*, the Obedient Plant, named 'Vivid'. This is a plant of such excellence that it has received the Award of Garden Merit. In a reasonably moist soil it soon forms a fairly dense clump of erect growths not over 18 inches tall, bearing terminal four-ranked spikes of large tubular, rosy-purple flowers.

During August there is plenty to interest the visitor in the trials of flowers and vegetables. The trials form a very important part of the activities of Wisley, and regular visitors, who have many opportunities

to observe their progress, will appreciate how great a demand they make on the time of the staff. The trial of dahlias of the ordinary types is the largest this year, and embraces no fewer than 245 different stocks. Some of the varieties have already received awards, and continue to be grown for comparison with new acquisitions. There are also twenty-nine kinds grown from seed for summer bedding. In this group there are now some promising doubles. The majority of the dahlias are planted in the ground west of the hostel, and close by there are the 140 stocks of chrysanthemums. Shortage of space has necessitated closer planting than has been the rule in former years, but there will be plenty of room for the plants to develop fully, and the usual stopping and disbudding will be practised. The trial includes over thirty new pompon varieties, both dwarf and tall. These quaint little flowers, very popular at present, retain their freshness for a long period and are admirable for cutting.

Of gladioli there are 127 stocks. When in full flower these always excite the highest admiration, but one not infrequently hears the comment that many of the modern varieties, bearing flowers 5 inches across on a stem attaining a height of 5 feet or more, are out of place in small gardens. Many amateurs will, therefore, be interested in the smaller-flowered "Butterfly" type, which have stems of more moderate height. The trial of forty-two different clarkias is being grown in the Vegetable Trial Ground, where they can be given an open site permitting the wide spacing required for their perfect development. All are derivatives of *Clarkia elegans*.

Among the vegetable trials two will be of special interest now. Self-blanching celery has become increasingly popular in recent years as it matures in advance of trench celery. The trial now in progress comprises twenty-three stocks of green-stalked varieties belonging to the groups known as 'Summer Pascal' and 'Utah Pascal', which are widely grown in the U.S.A. Many have tender, stringless stalks of high quality. Tomatoes cover a wide range of types, including bush varieties. Some of these are well worth growing if they can be allowed space to develop fully. At least a square yard should be given to each plant. Much of the labour of tying and disbudding is saved by growing these. Visitors will also see some of the American varieties which have very large, ten- or twelve-celled fruits. These are of more solid texture than the two- or three-celled fruits generally preferred for use in salads, and many uses can be found for them in the kitchen.

On Battleston Hill and in the wild garden, there will be many interesting things to see, including the later lilies. On the crest of the hill, among the azaleas, there are several clumps of *Lilium auratum* which were raised from seed of a wild stock of the species, sown about nine years ago. These plants have grown undisturbed for several years, receiving no special treatment other than a generous mulch of leaves. They are of great vigour and appear to be virus-free, which cannot be said of certain other plantings grown from vegetative propagations.

THE ROYAL HORTICULTURAL SOCIETY PUBLICATIONS

ROSES

By F. FAIRBROTHER

THIS is the first volume of the new series of Penguin Handbooks prepared in collaboration between The Royal Horticultural Society and Penguin Books. It is a practical handbook for all who would like to grow roses and contains plans for rose gardens, details of preparing the soil, planting, cultivation, pruning, propagating and preparing roses for show as well as a fascinating chapter on the history of the present cultivated roses. There are descriptions of shrub roses and a selected list of the author's recommendations for Hybrid Tea, Floribunda and Climbing Roses. Mr. Fairbrother writes with authority, having grown roses since boyhood and now being Deputy President of the National Rose Society.

This series is intended for all those starting a small garden for the first time as well as for those who are more experienced and, like *The Vegetable Garden Displayed* and *The Fruit Garden Displayed*, aims at showing the operations through pictures of their being carried out by experts. The Series will be very freely illustrated.

Now ready. Price 5s., postage and packing 9d.

'At the price, you could not have better value . . . (Mr. Fairbrother) has the gift of passing on his knowledge in the most practical way. . . . The rose-grower will find everything he wants in this Penguin on roses, and we may look forward to many more titles to follow in this series.' V. Sackville-West in The Observer.

Next volume to be published in the late Autumn:

Annuals and Biennials, by A. P. BALFOUR, V.M.H.

Other publications

The R.H.S. Dictionary of Gardening. Edited by F. J. Chittenden, O.B.E., F.L.S., V.M.H. A practical and scientific encyclopaedia on horticulture. Illustrated in four volumes containing 2,300 pp. cloth bound. Price **£12 12s. 0d.**, by post, Inland **£13 4s. 0d.**, Overseas **£13 7s. 0d.**

Supplement to Dictionary of Gardening. Price £2 2s. 0d., by post £2 5s. 0d.

Asiatic Magnolias in Cultivation. By G. H. Johnstone, O.B.E., V.M.H. Contains 15 plates in offset litho from drawings, as well as 20 pp. of monochrome illustrations in collotype. Price £3 3s. 0d., by post £3 6s. 0d.

Snowdrops and Snowflakes. A study of the genera *Galanthus* and *Leucojum* by Sir Frederick Stern, O.B.E., M.C., F.L.S., V.M.H. Price £1 5s. 0d., by post £1 6s. 9d.

The Genus Tulipa. By Sir A. Daniel Hall, F.R.S., D.Sc., LL.D., V.M.H. 160 pp., with 40 plates in colour and 11 in black and white, cloth bound. Price £1 1s. 0d., by post £1 3s. 0d.

The Journeys and Plant Introductions of George Forrest, V.M.H. Edited by Dr. J. Macqueen Cowan, C.B.E., V.M.H. Fully illustrated, 250 pp. cloth bound. **£1 10s. 0d.**, by post **£1 11s. 9d.**

The Horticultural Colour Chart, Volumes 1 and 2. Published in collaboration with the British Colour Council. Each volume contains 100 plates. The first volume consisting of a Spectrum Range of 64 full hues, 26 tints and 10 shades of the 64 full hues, and the second volume consisting of 34 tints, 28 shades and 38 greyed hues making a more complete colour guide, contained in cloth cases. Price £5 0s. 0d., by post £5 2s. 6d.

The Rhododendron Handbook 1956. A complete revision of this work has been undertaken and the new work is published in two volumes. Part One deals with species and Part Two with hybrids. Price 12s. 6d. each volume, by post 13s. 6d.

Some Good Garden Plants. Descriptions and cultural notes of plants which have received the Award of Garden Merit. Illustrated, 90 pp. edition. 1950. Paper. Price 6s., by post 6s. 9d.

The Fruit Garden Displayed. A comparable volume to *The Vegetable Garden Displayed.* it is well illustrated with over 300 photographs, and contains 176 pp. Price, paper covers 6s. 6d., by post 7s. 6d., cloth 8s. 6d., by post 9s. 6d.

The Vegetable Garden Displayed. Giving all essential instructions for laying out and cropping a vegetable plot and storing of produce. 300 illustrations in photogravure, 112 pp. 13th impression. Paper cover only. Price 3s. 6d., by post 4s. 3d.

A Supplementary Index to the Society's Journal from 1936 to 1945. Cloth £1 0s. 0d., by post £1 1s. 9d.

A Second Supplement 1946 to 1955. Cloth £1 10s. 0d., by post £1 11s. 9d.

Curtis's Botanical Magazine

Edited by W. B. TURRILL, O.B.E., D.Sc., F.R.S., F.L.S., V.M.H.

The Botanical Magazine is the oldest current scientific periodical of its kind with coloured illustrations in the world, and in the beauty of production and the high standard of its contributions it is unique. It should be found in every library with a botanical or horticultural section. Volume 172, the eighth in the New Series, is published in four parts over the two-year period 1958–1959. Subscription rates **£2 2s. 0d.** per year, or **£4 4s. 0d.** for the complete volume. Complete volumes of the New Series are also available since it was started in 1948. Price **£4 0s. 0d.** per volume.

Curtis's Botanical Magazine Index

This work contains a complete index of all plates published in *The Botanical Magazine* up to the end of Volume 164, together with the correct name of the plant as far as may be ascertained and the synonyms quoted in the *Magazine*. In addition text references to other plants in the *Magazine* are indexed. An Appendix gives a list of the plants featured since the beginning of the new series up to the end of 1955. Prices: Paper bound **£2 2s. 0d.**, by post **£2 3s. 6d.**; Blue Buckram **£2 8s. 0d.**, by post **£2 10s. 0d.** *Interleaved edition*: Paper bound **£2 10s. 0d.**, by post **£2 12s. 0d.**; Blue Buckram **£2 17s. 6d.**, by post **£3 0s. 0d.**

OTHER PUBLICATIONS—*continued*

Classified List and International Register of Daffodil Names. New edition. Price **6s.**, by post **6s. 9d.**

Classified List of Tulip Names. Price **6s.**, by post **6s. 9d.**

Tentative Check List of Delphinium Names. Price **3s. 6d.**, by post **4s.**

A Tentative List of Hyacinths and other Bulbous and Tuberous-rooted Plants. Price **6s.**, by post **6s. 9d.**

Guide to Wisley Gardens. Price **2s.**, by post **2s. 6d.**

The Horticultural Show Handbook. A guide to Judges, Schedule-makers and Exhibitors. Price **2s.**, post free.

PAMPHLETS

International Code of Nomenclature for Cultivated Plants. New edition. Price **2s. 6d.**

National Fruit Trials (1921–1950), Report of. By J. M. S. Potter, N.D.H. Price **2s.**

Pruning Hardy Shrubs. By A. Osborn. Price **1s. 3d.**

A Guide to Vegetable Growing for Small Gardens. By J. Wilson. Price 1s.

The Genus Nomocharis. By D. Wilkie. Price 1s.

Annual and Biennial Flowers. By A. P. Balfour, F.L.S., V.M.H. Price 1s.

Cultivation of Roses. By J. Wilson. Price 1s.

A Guide to the Cultivation of Apricots, Peaches, Nectarines, **Figs and Grapes.** By J. Wilson. Price 1s. 6d.

Hardy Herbaceous Plants for the Garden. By J. B. Paton. Price 1s. 6d.

Hedges and Screens. Revised edition. Price 1s. 3d.

Decorative Autumn Fruits and Berries. By Lanning Roper. Price 1s.

Gardening on Chalk. By Sir Frederick Stern, O.B.E., M.C., F.L.S., V.M.H. Price 1s.

Gardening with Electricity. By A. W. Gray. 1s.

Pests and Diseases, Fruit Spraying Calendar. Price 6d.

Cultivation of Bulbs in Bowls. By G. W. Leak, V.M.H. Price 1s.

An Amateur's Shrub Garden. By A. Osborn, revised 1955. Price 1s.

The Pruning of Fruit Trees. By J. M. S. Potter, N.D.H. Price 1s. 3d.

The Production of Quality in Apples. By Prof. T. Wallace, C.B.E., M.C., F.R.S., V.M.H. Price 1s.

The Modern Delphinium. By R. Parrett. Price 1s.

Lawns. Essentials of Establishment and Maintenance. By R. B. Dawson, M.Sc., F.L.S. Price 1s.

Practical Aspects of the Manuring of Fruit in Gardens. By Prof. T. Wallace, C.B.E., M.C., F.R.S., V.M.H. Price 1s. 3d.

The Choice and Care of Trees for the Small Garden. By F. P. Knight, F.L.S. Price 1s.

Postage and packing **4***d. per pamphlet,*
6*d. for two to four pamphlets.*

ORDER FORM

TO THE SECRETARY
THE ROYAL HORTICULTURAL SOCIETY
VINCENT SQUARE, LONDON, S.W. 1

Please supply the following Publications:

		C/F			
					P.T.O.

		B/F			
	(*See individual titles*) **Postage**				
	TOTAL AMOUNT				

I enclose Cheque/Postal Order for.....
(Cheques, Money and Postal Orders should be made payable to "The Royal Horticultural Society". Dollar cheques on U.S. Banks are easily negotiable and preferable to U.S. Money Orders.)

To be sent to:

NAME (*Block capitals*)

.....

ADDRESS (*Block capitals*)

.....

.....

.....

.....

1959 Year Books

The 1959 editions of the *Daffodil* and *Tulip*, *Lily*, and *Rhododendron and Camellia Year Books* will be published in the autumn of 1958 and will all be generously illustrated with photographs. Among the articles to be included will be, Daffodils in the Savill Gardens, Windsor Great Park; the making of a new lily garden at Kew; Lilies at Villa Taranto, Italy, an article on *Chionodoxa* and in the *Rhododendron and Camellia Year Book* an account of some Rhododendron Gardens in Argyllshire.

1958 Year Books

DAFFODIL AND TULIP. This issue contains useful articles on Hot-water treatment and on Temperature Influence on Bulb Flowers, by experienced and well-known growers. Mr. Alec Gray writes on the Small Jonquils and in addition there are articles from the U.S.A., Show Reports from England and overseas and Tulip Trial reports, together with a list of newly registered Daffodil names.

LILY. This edition is again of great interest to all lily growers. Articles are included describing the cultivation of lilies in Scotland, Northumberland and Norfolk. There are also contributions from Canada, New Zealand and the U.S.A. Those interested in Erythroniums will find Mr. Anderson's article on this genus most interesting.

RHODODENDRON AND CAMELLIA. The history and work of the Rhododendron Society (1915–52) is described by Mr. G. H. Johnstone and makes most interesting reading. Articles on Rhododendron gardens describe the gardens on the Island of Gigha on the West coast of Scotland, Pylewell Park, Hampshire, and Westbourne in Surrey. Again there are articles from the U.S.A. and New Zealand, the latter on Camellias; Sir Giles Loder, who visited Virginia in 1957, describes the Camellias he saw during his trip.

FRUIT. This issue is made up of articles of wide and varied interest from fruit growing in Jamaica and in Poland—to notable fruitbooks of the nineteenth century. Articles on the Recognition of Fruit Injuries, Staking Fruit Trees, Peaches as Bush Trees are among others of great practical value.

Price **10s.** each. Postage **1s. 3d.** U.S.A. **$1.65,** post free.

S.B.

A Revision of the Genus Camellia

By J. ROBERT SEALY
(Royal Botanic Gardens, Kew)

This is a detailed botanical revision based primarily on wild material of the genus preserved in herbaria. Eighty-two species are recognized and are disposed in twelve sections, and keys are provided for their identification. A comprehensive description is given of each species, with a line-drawing, references to literature, a list of the specimens examined, and explanatory comments. There are chapters concerning the history, botanical relationships, and geographical distribution of the genus, and others dealing with the inter-relationships of the species, and with the imperfectly known species. Finally there is a chapter about camellias in gardens—a review of all the species known to have been introduced into cultivation, together with an account of the interspecific hybrids raised during the past thirty years or so. It is anticipated that this will form the standard work on the genus for many years to come. Mr. Sealy is the acknowledged botanical authority on the genus. The book, which is Small Royal Quarto (12¼ in. × 9¼ in.) of about 230 pages, has a coloured frontispiece by Stella Ross-Craig, 6 maps, 95 line-drawings, and a chart.

Publication late September

Price **£3 10s.** Postage and packing 3s.

The International Rhododendron Register

The 14th International Horticultural Congress entrusted to the R.H.S. the preparation of the register of rhododendron names and this is undoubtedly the most complete list ever compiled. As far as they are known a brief description and the parentage of all plants are given as well as details of the raiser and introducer and also any awards received. It should be useful to all raisers of new rhododendrons.

Publication late September

Price **25s.** Postage and packing 1s. 6d.

In the new borders beside the broad walk up the hill there are many interesting lilies, including some newer de Graaff hybrids. Hydrangeas, hostas, fuchsias and agapanthus have been largely planted in this area in place of the old hedges of *Rhododendron luteum*.

The west end of Seven Acres will be gay with the summer-flowering heaths and varieties of ling, and in various parts of the Gardens there are some outstanding late trees and shrubs, such as *Magnolia grandiflora*, *Aesculus parviflora*, *Campsis grandiflora* and *Hydrangea paniculata* var. *grandiflora*. The appearance here and there of little patches of flowers of *Leucojum autumnale* and *Cyclamen neapolitanum* marks the beginning of a succession of bulbous flowers and signals the approach of autumn.

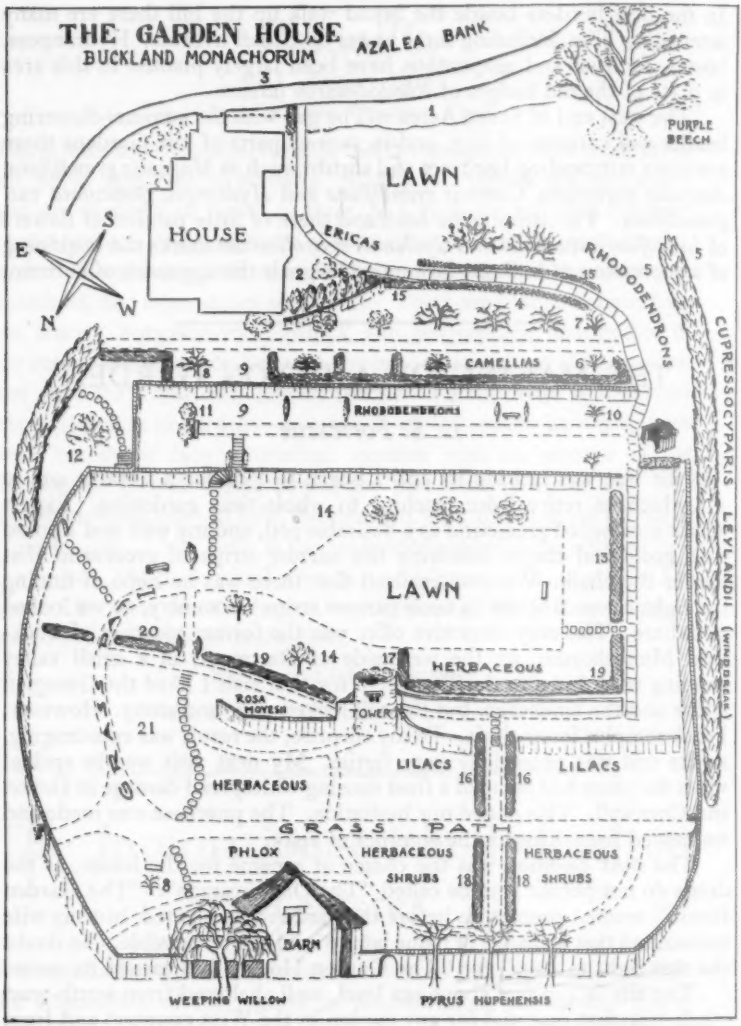
THE MAKING OF A DEVON GARDEN

L. S. Fortescue

As the war was nearing its end I began to look for a suitable site to which to retire from teaching to whole-time gardening. Expert advice counselled greensand as a desirable soil, and my wife and I pored over geological maps, following the narrow strips of greensand that border the chalk. We soon realized that there was no hope of finding the right house and site in such narrow strips of country, so we looked elsewhere. The only attractive offer was the former vicarage of Buckland Monachorum, on the west side of Dartmoor, in a small valley running west down to the Tavy. On my first visit I liked the Georgian house and the landscape, but the soil looked poor and stony. However, I took samples for analysis. To my surprise, the result was encouraging, as the soil was potentially very fertile. My next visit was in spring, when the place had escaped a frost causing widespread damage in Devon and Cornwall. This ended our hesitation. The purchase was made and we moved from Eton in the summer of 1945.

The next question was the choice of a name for the house, as the deeds do not permit it to be called "The Old Vicarage". "The Garden House" seemed premature before the garden was planted, but my wife maintained that a change of name later would not be possible. No doubt she was right as usual, for "The Garden House" has earned its name.

The site is 450 feet above sea level, well sheltered from south-west winds (the first essential for any garden in the West country) and from the north. It is exposed to the north-west and only partially sheltered from the east. Considerable shelter has, however, now been obtained by planting windbreaks of × *Cupressocyparis leylandii*, recommended to me by ARTHUR OSBORN, formerly of Kew, but it is a case of compromising between the need for shelter and for keeping some views of the valley and Cornish hills. The sacrifice entailed by an attempt to shelter the whole garden would be too great, but a considerable part of it is



KEY TO PLAN

1. Camellias, etc.
2. *Magnolia stellata*
3. Platform
4. Old rhododendrons
5. New rhododendrons
6. *Magnolia* × *loebneri*
7. *Magnolia* × *watsoni*
8. *Magnolia wilsonii*
9. Blue rhododendrons
10. *Magnolia* 'Brozzonii'
11. *Eucryphia* × *intermedia*
12. *Prunus* 'Schimidsu Sakura'
13. *Thuya lobbii*
14. *Rosa* × *cantabrigiensis*
15. Handsworth Box
16. *Chamaecyparis lawsoniana* 'Allumii'
17. *Chamaecyparis lawsoniana* 'Donard Gold'
18. *Chamaecyparis lawsoniana* 'Fletcheri'
19. *Lonicera yunnanensis*
20. Pittosporum
21. *Ceanothus* 'Gloire de Versailles'

already sheltered and the shelter is increasing with the rapid growth of the *C. leylandii*. These trees form an admirable windbreak and being planted up and down the slope, and not across it, they do not impede air drainage. They remain well furnished to the base and do not grow broad, trees of over 20 feet being not more than 7 feet wide at base. They are efficient, as not being stiff they filter and slow down wind, which jumps over unyielding barriers. Moreover, their waving sinuous line of green is very attractive, and colour is not sombre.

As regards fertility, the analysis has proved correct, for with generous treatment growth has been amazingly rapid. Soil preparation proved unexpectedly laborious. The walled garden had been cultivated for centuries, but it had only been scratched and to get 18 inches of workable soil great quantities of stone had to be removed. With a rainfall of rather over 50 inches, deeper digging is not necessary. Even big forest trees are surprisingly shallow rooted in these conditions. At Eton I trenched soil to a depth of 3 feet and shrub roots penetrated to this depth, but here they never do. Fertility has been obtained by adding much straw compost, bracken, leaf-mould, peat from Dartmoor, washed granite sand from china clay works, shoddy and artificial fertilizers. We started with straw compost from waste collected from farms after threshing, but, in spite of composting, so much weed seed remained that we had to give it up. Bracken cut on the moor has proved our salvation, as it is weed free, as a mulch keeps down weeds, and plants thrive on it. If a mulch of bracken is removed from around rhododendrons, roots are found to have grown up into it like fur. Results obtained by this treatment, and from naturally favourable conditions, have been so rapid that it already gives the impression of a well-established garden. The soil, while retentive of moisture, is perfectly drained and conditions favour a very wide range of shrubs, though we cannot grow the tenderer plants which survive most winters in Cornwall, near Falmouth and Penzance. During 1954, 1955 and 1956, however, there were many losses in gardens even in these more favoured districts. Early autumn and late spring frosts are rare. Our climate is, however, treacherous. Until Christmas, weather often remains very mild and wet. This does no harm to rhododendrons and camellias, which are naturally dormant at that period, but the dry climate and Mediterranean type of plant, such as *Abutilon vitifolium*, carpentaria, ceanothus, cistus, cytisus, lavender, rosemary, continues to grow, and in this state may succumb to a sudden frost of 12 degrees, which can do more damage than 20 degrees of frost in a drier colder climate.

The soil of surrounding meadows and of the upper part of the garden is acid, pH 5·5, but that of the bottom of the garden, which has been cultivated for centuries, has become alkaline with a pH of 7 to 8. The sudden transition from ericaceous plants, mainly evergreen, to lime-tolerant plants, mainly deciduous, is striking, and provides contrast and variety. Both sections are planted chiefly with flowering shrubs, which have been collected with a view to garden decoration and not to forming

a botanical collection, and constant care is devoted to arrangement and grouping. In this respect, the lime-tolerant shrubs are much the more accommodating subjects, being better mixers than rhododendrons and azaleas. The latter can produce violent colour clashes and be much too gaudy for the soft English landscape. Fortunately, offenders can be moved about in full flower, until a suitable site is found for them, failing which they are ruthlessly expelled!

The approach to the garden, after passing a cattle grid to keep out moor ponies, is through a park-like meadow, with mature beech trees and a young plantation of ornamental cherries, CAPTAIN COLLINGWOOD INGRAM kindly having sent me propagating material from his collection at Benenden. In the case of cherries and rhododendrons we prefer a succession of flower rather than massed planting for simultaneous flowering. The flowering season of individual varieties of cherry may be short, but from *Prunus sargentii*, which starts flowering about mid-March, until 'Shimidsu Sakura' ('Longipes') and 'Pink Perfection' end, in mid-May, there is a succession of flower for over two months. Many varieties are also really first-class dual-purpose plants, as they have splendid autumn colour, lasting from mid-September until mid-November. Among the species and hybrids of species, our favourites for flower are *Prunus* × *hillieri* (*incisa* × *sargentii*), *pubescens* (Ingram's var.), *sargentii* and *serrulata spontanea*. *Sargentii*'s combination of pink flowers with brownish-red young foliage is not quite as good as the whiter flowers of the other three, but all are lovely and have a grace and elegance lacking in the large-flowered varieties. Of the latter our favourites are *P. avium flore pleno*, 'Shimidsu Sakura' ('Longipes'), 'Shirofugen', 'Shirotae', 'Tai-Haku', 'Taoyama' and 'Ukon'. For autumn colour many are good, but the most brilliant and outstanding are *sargentii*, 'Kursar', *pubescens*, × *hillieri*, × *juddii*, 'Taoyama' and 'Ukon', colouring here in this sequence; none surpass *P. sargentii*, *pubescens* and *hillieri*. Of *P.* × *hillieri*, the raiser has now an upright form, resembling a Lombardy poplar in habit, named *hillieri* 'Spire', which is likely to be a welcome addition to the very limited number of trees requiring little elbow room. Another Hillier cherry is *P. incisa* 'Praecox', which gained an Award of Merit in 1957. The ordinary *P. incisa* proved useless in my garden, as bull-finches took all the flower buds, but *incisa* 'Praecox' follows *P. subhirtella autumnalis* in flower in late autumn before bud-raiding starts. Bird damage has caused us to eliminate other cherries besides *incisa*. 'Okame', 'Pandora' and *yedoensis* were not worth their keep and 'Kursar' only justifies it for its autumn colour. *P. cerasifera atropurpurea* (*pissardii*), forsythias and *P. triloba* also had to be banished from the garden, as birds only left a few sparse buds. This year (1958) they have also begun to raid chaenomeles (Cydonia japonica) and apple trees.

Cherries are most accommodating trees, as they flourish in so many different soils, both acid and limy, and in different climatic conditions. Our young trees are very vigorous. In ten years, *P. avium flore pleno* has reached a height of over 25 feet.

The cherry plantation ends with a grove planted with several dozen kinds of camellias, between a beech and a purple beech and backed by other trees and laurels that give shelter. Along the other side of the drive at this point are a number of corylopsis for spring flower (these have taken the place of the bird-raided forsythias and we now rank them much higher for grace of flower and scent) and hydrangeas for autumn flower, mainly the lace-caps and three forms of *H. villosa*. *H. villosa* is a decorative plant, but needs a good deal of space and shelter from wind and in the garden proper there are too many other candidates for admission. The *hortensis* hydrangeas, both lace-caps and mop-heads, with their uninteresting foliage, are more suited for this semi-woodland setting than for garden use. Approaching the house to the left of the drive, is a bed of rhododendrons, mahonias (*bealei* and *lomariifolia*), eucryphias and tree heaths (*arborea alpina*, *lusitanica* and *veitchii**). R. 'Arthur Smith' (cream), 'Snow Queen' and 'Sir Charles Lemon' (white) contrast well with the foliage of a purple beech on the lawn behind them. On the edge of the lawn are planted varieties of *R.* (azalea) *ledifolium* and white and pale coloured Kurumes.

Above the drive, nearer the house, is a bank of deciduous azaleas, starting with orange reds and the blood-red 'Satan' merging with *occidentalis* hybrids, of which 'Exquisita' is our favourite. On the other side, separating the drive from the lawn, is a short hedge of *Prumnopitys elegans* (Chilean yew, a most attractive hedging plant), followed by a strip planted with camellias (1), *R. yunnanense* (also good with the purple beech and with deciduous azaleas), *Hamamelis mollis* and the very effective *H. mollis* 'Pallida' and *Viburnum bodnantense* 'Dawn'. These winter-flowering shrubs, with *Chimonanthus fragrans*, are purposely placed by house and drive so that their flowers and scent can be enjoyed at close quarters. Other features near the house are the fragrant *Viburnum* 'Burkwoodii' and 'Park Farm hybrid', a bed of summer flowering heaths, and a *Magnolia stellata* (2), backed by a hedge of Chamaecyparis 'Allumii'. This magnolia gains greatly from an evergreen setting, and from the shelter, for its flowers are quickly browned by wind. We prefer the more shapely flowers of *M. salicifolia* and *M. loebneri* (*stellata* × *kobus*) to the rather ragged flowers of *stellata*. Their flowers, like those of *M. kobus*, have also the great advantage of not being weather-sensitive.

Opposite the front door, on what was formerly a gravel sweep, we made an 18-inch high platform (3)—it was less trouble to bring in the soil than to excavate the primeval rock!—with a dry wall in front of it along the drive, and backed by a high retaining wall and hedge. The front and centre are planted with low growers, e.g. cyclamens, bulbs, alpines, dwarf rhododendrons and Kurume azaleas, in front of R. 'Lady Alice Fitzwilliam', camellias, *Pieris taiwanensis*, *Corylopsis pauciflora*, a large plant of *Paeonia suffruticosa* (pure white with a crimson blotch in the centre, resembling a giant cistus flower) and *Erica arborea alpina*. In

* *Erica veitchii* is liable to be singed by frost.

the centre stands the fastigiate form of *Magnolia salicifolia* and at a distance on either side at higher levels Prunus 'Shimidsu Sakura' and *P. affinis*. Giving shelter from the east, and 10 feet above the drive, is a 10-foot clipped beech hedge, with *Pieris forrestii* in front of it.

The main garden lies below the house on a steep terraced hillside facing slightly west of north. There are five different levels. On the east and north it is bounded by grey stone walls, 12 feet high. The length of the terraces is approximately 170 feet; they are of varying width and with the exception of the first and second do not extend to the full width of the garden but merge into the natural slope. This combination of formal and natural lines is a very happy one. High on the slope above the south-west end of the top terrace is a very tall group of old rhododendrons (4), 'Cornish Red', 'Cynthia' and an old white one (? 'Purity'), with purple beeches in the background. These old rhododendrons were moribund when we took over the garden, but removal of a thicket of dead wood and suckers (the home of innumerable blackbirds), a couple of mulches and annual dressings of artificial fertilizers * have restored them to full health and vigour. These are the only inmates of the garden, apart from the beech hedge and laurel windbreaks, which we have not planted ourselves. They are of great value as a background, dominating the terraces, and as a windbreak, and, vulgar as their colours may be, when lit by the evening sun against the dramatic colouring of the purple beeches, they are a most striking sight. Beside them are now forms of R. Loderi ('King George' and 'Helen'), 'Polar Bear', 'Cornish Cross' and a number of modern rhododendron hybrids. To the west they are bounded by the windbreak of *C. leylandii* which runs all down the west side of the garden.

On the terraces, to break the outline, upright growers such as eucryphias, amelanchiers, *Magnolia salicifolia* (fastigiate form), *Laburnum vossii*, Chamaecyparis 'Kilmacurragh', Prunus 'Amanagowa', *P. litigiosa* and stewartias have been planted. The east end of the top terrace is closed by *C. leylandii* and laurels—to the south-east are buildings. Apart from the upright growers, the largest plants on this terrace are *Magnolia* × *loebneri* (6) and *M.* × *watsoni* (7) at the west end, and *M. wilsonii* (8) at the east end.

This top terrace is flanked on both sides by camellias, including a flourishing *Camellia reticulata* on a west wall. Here and in the grove already mentioned, there are about a hundred different varieties of camellia and a further thirty are being grown for trial. Very careful selection is necessary for the limited space available. The primary consideration is that they must be good *garden* varieties. The flowers of singles and semi-doubles are much less subject to weather damage than those of doubles. A large camellia bush covered with browned

* Fertilizer used consists of 1 part triple superphosphate, 2 parts sulphate of potash (*not* muriate), 2 parts sulphate of ammonia. Two to three ounces per square yard. In some years only sulphate of ammonia has been used.

flowers is most unsightly. The very weather-sensitive kinds like the 'Mathotianas' and double whites, including 'Alba grandiflora', we plant only in the most sheltered corners. *Camellia* × *williamsii*, such as 'J. C. Williams' and 'Mary Christian', and C. 'Cornish Snow' (Caerhays hybrid), are neatest of all in this respect, for they have the great merit of dropping their faded flowers, of 'burying their dead', as the late LORD ABERCONWAY used to say, so that the bushes always look fresh. 'Cornish Snow' is charming when covered with its little butterfly-like flowers. Flowers of some × *williamsii*, however, such as 'First Flush', are very fragile and weather-sensitive. Of single *Camellia japonica* varieties, 'Jupiter' and 'Sylva', both red, are excellent garden plants; they are similar but 'Sylva' is a precocious flowerer and has finer foliage. 'White Swan' is a useful white, being much less weather-sensitive than the doubles. Of semi-doubles 'Elegans' (salmon-pink) and 'Mars' (red) are outstanding. 'Mars' is of 'Donckelarii' colour, but has a much better shaped flower than 'Donckelarii', which in our opinion it deserves to supersede. 'Elegans' has the further merit of exceptionally fine foliage. 'Mercury' is another good semi-double red that flowers a little later than 'Mars', of good upright habit, though colour is perhaps not quite as good as that of 'Mars'. The popular semi-double × *williamsii* 'Donation' also weathers well. This very free-flowering bright pink variety is most striking when lit by the sun in a green setting. It needs careful placing. The × *williamsii* camellias need some segregation from *japonica* varieties, as in all of them there is a touch of blue, derived from their *saluenensis* parent, which does not harmonize with the blue-free pinks and reds of *japonica* varieties.

This terrace is intersected by a path of paving stone running along its full length; from the west end curving flights of paving stone steps lead up to the house and down to lower levels. To avoid colour clashes, on the outside of the terrace four hedges, one of Handsworth box, two of camellias, and one of *Osmarea burkwoodii*—which is proving an excellent hedging plant—have been placed at right angles to the path and the camellia hedge on the edge of the terrace. The bright-coloured inmates segregated in the hedge-screened compartments are, in the most easterly section, a collection of the so-called "blue rhododendrons" (9), especially 'Blue Diamond', 'Blue Tit' and 'Sapphire', in front of a line of *augustinii* collected from a number of private gardens, interplanted with Camellia 'J. C. Williams'. At the east end of this compartment is *Rhododendron schlippenbachii*, which is an excellent foil to the "blues" in front of *Magnolia wilsonii*. Opposite this bed, against a stone wall, are Rhododendrons 'Cowslip', 'Fragrantissimum', 'Lady Alice Fitzwilliam', etc., and in autumn the whole wall becomes a bright red curtain of *Tropaeolum speciosum*. The next compartment contains the very brilliant yellow and orange azaleas, such as 'Altaclarense', 'Golden Oriole' and 'Sunbeam', with 'Toucan' and 'Exquisita' to tone them down and set them off. The third compartment contains azaleas of the *rustica flore pleno* group; in the fourth, among other plants, are

the centre stands the fastigiate form of *Magnolia salicifolia* and at a distance on either side at higher levels Prunus 'Shimidsu Sakura' and *P. affinis*. Giving shelter from the east, and 10 feet above the drive, is a 10-foot clipped beech hedge, with *Pieris forrestii* in front of it.

The main garden lies below the house on a steep terraced hillside facing slightly west of north. There are five different levels. On the east and north it is bounded by grey stone walls, 12 feet high. The length of the terraces is approximately 170 feet; they are of varying width and with the exception of the first and second do not extend to the full width of the garden but merge into the natural slope. This combination of formal and natural lines is a very happy one. High on the slope above the south-west end of the top terrace is a very tall group of old rhododendrons (4), 'Cornish Red', 'Cynthia' and an old white one (? 'Purity'), with purple beeches in the background. These old rhododendrons were moribund when we took over the garden, but removal of a thicket of dead wood and suckers (the home of innumerable blackbirds), a couple of mulches and annual dressings of artificial fertilizers * have restored them to full health and vigour. These are the only inmates of the garden, apart from the beech hedge and laurel windbreaks, which we have not planted ourselves. They are of great value as a background, dominating the terraces, and as a windbreak, and, vulgar as their colours may be, when lit by the evening sun against the dramatic colouring of the purple beeches, they are a most striking sight. Beside them are now forms of R. Loderi ('King George' and 'Helen'), 'Polar Bear', 'Cornish Cross' and a number of modern rhododendron hybrids. To the west they are bounded by the windbreak of *C. leylandii* which runs all down the west side of the garden.

On the terraces, to break the outline, upright growers such as eucryphias, amelanchiers, *Magnolia salicifolia* (fastigiate form), *Laburnum vossii*, Chamaecyparis 'Kilmacurragh', Prunus 'Amanagowa', *P. litigiosa* and stewartias have been planted. The east end of the top terrace is closed by *C. leylandii* and laurels—to the south-east are buildings. Apart from the upright growers, the largest plants on this terrace are *Magnolia* × *loebneri* (6) and *M.* × *watsoni* (7) at the west end, and *M. wilsonii* (8) at the east end.

This top terrace is flanked on both sides by camellias, including a flourishing *Camellia reticulata* on a west wall. Here and in the grove already mentioned, there are about a hundred different varieties of camellia and a further thirty are being grown for trial. Very careful selection is necessary for the limited space available. The primary consideration is that they must be good *garden* varieties. The flowers of singles and semi-doubles are much less subject to weather damage than those of doubles. A large camellia bush covered with browned

* Fertilizer used consists of 1 part triple superphosphate, 2 parts sulphate of potash (*not* muriate), 2 parts sulphate of ammonia. Two to three ounces per square yard. In some years only sulphate of ammonia has been used.

flowers is most unsightly. The very weather-sensitive kinds like the 'Mathotianas' and double whites, including 'Alba grandiflora', we plant only in the most sheltered corners. *Camellia* × *williamsii*, such as 'J. C. Williams' and 'Mary Christian', and C. 'Cornish Snow' (Caerhays hybrid), are neatest of all in this respect, for they have the great merit of dropping their faded flowers, of 'burying their dead', as the late LORD ABERCONWAY used to say, so that the bushes always look fresh. 'Cornish Snow' is charming when covered with its little butterfly-like flowers. Flowers of some × *williamsii*, however, such as 'First Flush', are very fragile and weather-sensitive. Of single *Camellia japonica* varieties, 'Jupiter' and 'Sylva', both red, are excellent garden plants; they are similar but 'Sylva' is a precocious flowerer and has finer foliage. 'White Swan' is a useful white, being much less weather-sensitive than the doubles. Of semi-doubles 'Elegans' (salmon-pink) and 'Mars' (red) are outstanding. 'Mars' is of 'Donckelarii' colour, but has a much better shaped flower than 'Donckelarii', which in our opinion it deserves to supersede. 'Elegans' has the further merit of exceptionally fine foliage. 'Mercury' is another good semi-double red that flowers a little later than 'Mars', of good upright habit, though colour is perhaps not quite as good as that of 'Mars'. The popular semi-double × *williamsii* 'Donation' also weathers well. This very free-flowering bright pink variety is most striking when lit by the sun in a green setting. It needs careful placing. The × *williamsii* camellias need some segregation from *japonica* varieties, as in all of them there is a touch of blue, derived from their *saluenensis* parent, which does not harmonize with the blue-free pinks and reds of *japonica* varieties.

This terrace is intersected by a path of paving stone running along its full length; from the west end curving flights of paving stone steps lead up to the house and down to lower levels. To avoid colour clashes, on the outside of the terrace four hedges, one of Handsworth box, two of camellias, and one of *Osmarea burkwoodii*—which is proving an excellent hedging plant—have been placed at right angles to the path and the camellia hedge on the edge of the terrace. The bright-coloured inmates segregated in the hedge-screened compartments are, in the most easterly section, a collection of the so-called "blue rhododendrons" (9), especially 'Blue Diamond', 'Blue Tit' and 'Sapphire', in front of a line of *augustinii* collected from a number of private gardens, interplanted with Camellia 'J. C. Williams'. At the east end of this compartment is *Rhododendron schlippenbachii*, which is an excellent foil to the "blues" in front of *Magnolia wilsonii*. Opposite this bed, against a stone wall, are Rhododendrons 'Cowslip', 'Fragrantissimum', 'Lady Alice Fitzwilliam', etc., and in autumn the whole wall becomes a bright red curtain of *Tropaeolum speciosum*. The next compartment contains the very brilliant yellow and orange azaleas, such as 'Altaclarense', 'Golden Oriole' and 'Sunbeam', with 'Toucan' and 'Exquisita' to tone them down and set them off. The third compartment contains azaleas of the *rustica flore pleno* group; in the fourth, among other plants, are

zenobias, a number of azaleas, *R. atlanticum* and *R. vaseyi*, *R. campylocarpum elatum* and a wide spreading bush of R. 'Elizabeth'. This plant, sent from Bodnant in 1947 as a small rooted cutting, now measures 3 feet × 7 feet. Beyond the osmarea hedge (very fragrant in flower) in the last compartment is a bank of *Rhododendron amoenum*, screened by a setting of foliage and of a large *Wistaria venusta* and other white flowers. The amoenums are not seen from a distance, so that their quarrelsome colour does not obtrude. Curving steps lead down this bank to the next terrace below a 7-foot stone retaining wall. At the bottom of the steps on the left is a thatched summer house with spreading trees of Prunus 'Shirotae' on each side of it and behind them the windbreak of *Cupressocyparis leylandii* continuing down the slope.

To the east lies the narrowest of the main terraces, 21 feet wide, traditionally known as "the Bowling Green", also with a flagged path running down the centre. On the right, in front of the retaining wall, is a flourishing Magnolia 'Brozzonii' (10)—in my opinion the finest form of the *soulangiana* magnolias—and a line of rhododendrons, mostly Exbury hybrids, including 'Day Dream', 'Halcyone', 'Hawk', Lady Bessborough g. 'Roberte', 'Gaul', 'Carita', 'Tally-Ho', 'Romany Chal', 'Grosclaude', and some *campylocarpum* hybrids ('Letty Edwards', 'Marcia' and 'Damaris'). There is also a large bush of a very good form of *R. decorum*, white with green centre, combining the qualities of beauty of flower, fine foliage and fragrance. Planted in 1947, some of these rhododendrons are now 10 feet high × 12 feet wide. By good luck rather than by design, they flower in succession and not simultaneously; of the three big reds, 'Gaul' flowers before the other rhododendrons, 'Tally-Ho' and 'Fusilier' after them—fortunately, for red rhododendrons, very effective as individuals in a setting of green and well placed for light, are quarrelsome in company. It is noteworthy that in our conditions rhododendrons and camellias flourish in full sun, making vigorous but sturdy and compact growth, which buds up freely. Spaces among the rhododendrons are planted with primulas and *Meconopsis betonicifolia*. Upright-growing Chamaecyparis 'Kilmacurragh' stand on each side of a bench from which there is a view over the lower garden and up the valley.

Towards the east end of this terrace is another bench with a *Eucryphia* × *intermedia* (11) rising up on each side of it. These eucryphias distinguished themselves in 1957 by flowering continuously from late July until mid-September, a much longer season than that of E. 'Nymansay'. In front of each *E. intermedia* is a plant of *Viburnum tomentosum plicatum grandiflorum*, which is very effective with its red neighbour R. 'Fusilier'. Under the retaining wall, 8 feet high at this end of the terrace, before the bench is reached, are more *R. augustinii*, immediately below the *augustinii* and Camellia 'J. C. Williams' planted on top of the wall behind them, and another bed of a selection of "blue" rhododendrons with fothergillas, R. 'Alison Johnstone', *glaucophyllum*, *virgatum* white form, *williamsianum*, 'Yellow Hammer' and Camellia 'Salutation'.

The addition of whites, pale pinks and creams is a great help in showing off the "blues". Auriculas are planted in the spaces. Beyond the seat, in a very sheltered corner, is a white *R. griffithianum*, some *R. maddenii*, 'Lady Alice Fitzwilliam', 'Hawk', etc. *R. griffithianum* is first favourite in all our collection of rhododendrons, and its hybrid 'Penjerrick', of which we have several forms, would be our first choice among hybrids. The terrace is ended by an 8-foot retaining wall, above which in the centre stands Prunus 'Schimidsu Sakura' (12), in a small enclosed garden of white Kurumes, orange-red azaleas and *R. kaempferi*, out of mischief in a green setting. A feature of these terraced gardens is that in a small area they comprise a dozen small gardens without giving any impression of confinement.

On the outside of this terrace is a large bush of *Magnolia sieboldii*, *Rhododendron cinnabarinum roylei*, R. 'Vanessa', hibiscus (the fine and vigorous species *sinosyriacus*) and several plants of R. 'Elizabeth' and R. 'Ethel'. Seen from the top of the wall at the east end of the terrace these low growing red rhododendrons are very effectively backed by the white Prunus 'Shirotae' on each side of the summer house. To give height, mostly on the outside of the terrace, *Eucryphia glutinosa*, *E. lucida* × *cordifolia*, *Stewartia koreana* and *S. sinensis*, and *Magnolia* × *kewensis* have been recently planted.

Two flights of steps lead down to the next level. Near the east end curving granite steps, overhung by two bushes of the fragrant *Lonicera italica*, which flowers from July to September, lead down the face of the 10-foot wall. At the west end a long flight of slab steps leads down beside a clipped *Thuya lobbii* hedge (13) on the right. The use of this thuya was an unfortunate experiment, as when clipped it developed leaf spot, but replacement by a better hedge would mean loss of a windbreak for some years. On the left of the steps are bushes of the sweet-smelling Daphne 'Somerset' (one of the few easy daphnes) backed by a bed of delphiniums and paeonies in front of berberis and the western windbreak of *C. leylandii*. This bed between thuyas and *C. leylandii*, formerly the most exposed part of the garden, is now the most sheltered. At the foot of the steps an opening in the hedge and a path through a bed give access to a rectangular lawn; from the far end a central 6-foot grass path curves left towards the main garden wall.

This is the widest terrace, measuring 58 feet. The terrace and the lower levels of the garden are alkaline, and the type of plants changes accordingly. Camellias, rhododendrons, ericas, pieris and other lime haters give way to the lime-tolerant buddleias, carpentarias, ceanothus, deutzias, diervillas, *Genista cinerea*, hoherias, hypericums, kolkwitzias, lilacs, philadelphus, rhus, rubus, *Rosa* × *cantabrigiensis* (14) and *R. moyesii* (15), etc. Of chaenomeles (Cydonia japonica) only the strong-growing varieties succeed; the less vigorous such as 'Rowallane' and 'Simonii' only thrive on the acid soil. Hedges of camellia and osmarea are replaced by Chamaecyparis 'Allumii' (16), C. 'Donard Gold' (17), C. 'Fletcheri' (18), *Lonicera yunnanense* (19) and pittosporum

(20). It is not a change for the worse, for the lime-tolerant genera of this part of the garden have a grace of form and variety of foliage that is lacking to camellias and rhododendrons, however handsome the latter may be. The lower garden also benefits greatly from its position. The evergreens of the upper terraces, and above them the purple beeches, provide an excellent background. Looking up the hillside one faces south, so that the sun, coming down through foliage and flowers, especially of plants like *Rhododendron cinnabarinum roylei*, shows them off to the best advantage. Planting of the alkaline sections, however, has presented problems, for with this alkalinity resulting from long cultivation is linked an excessively high phosphate level. The soil has become unbalanced and plants are deprived of iron, magnesium and trace elements, so that by no means all lime-tolerant or lime-loving plants are happy in it. We find that all plants, including ornamental cherries and lilacs, do as well (or better) in our acid soil of pH 5·5 as in this alkaline soil of pH 7 to 8. Great quantities of acid humus have been used in the lower garden, but no appreciable lowering of the high pH has resulted. From our experience, it seems that the best way to apply acid humus is not to dig it into the ground, but to leave it to rot down as a mulch and remain on the surface round shrubs, so that their roots go up into it and get what they fail to get in the soil underneath them.

To come back to the lawn: under the 10-foot retaining wall is a line of two *Magnolia* × *soulangiana* and one *M.* × *soulangiana* 'Alexandrina', planted in 1948, now measuring 19 feet × 14 feet, hoherias and Prunus 'Amanagowa'. Under the sloping thuya hedge is a bed of philadelphus and an enormous bush of Rose 'Lady Curzon'. Of the philadelphus, 'Beauclerk', 'Burfordiensis', 'Belle Étoile', *delavayi* 'Nymans var.' and 'Sybille' are some of the best. One of the most beautiful, though not a vigorous grower, is 'Coupe d'argent'. P. 'Atlas', outstanding at Eton, unfortunately does not succeed here. 'Lady Curzon' is one of the few roses that really thrive in our climate, and is consequently allowed to ramp. The north side of the lawn is bounded by a herbaceous border in front of a 6-foot clipped hedge of *Lonicera yunnanense*.

At the east end of the lawn on each side of the grass path are grouped wistarias, *Deutzia gracilis carminea*, *D. discolor*, *Rosa* × *cantabrigiensis* and *R. hispida*. This is a successful planting scheme, as these shrubs flower together and blend well. In these lower levels of the garden planting is arranged in seven different sections, separated by clipped hedges and the lie of the land in such a way that each section has its flowering season and there is always some part or parts in flower from spring to autumn. Thus patchy and sparse effects are avoided. Although massed flowering of azaleas and rhododendrons seems to me overpowering, massed flowering of the lime-tolerant genera does not produce this effect. *Syringa persica* and *S. persica alba* and the four forms of *S. chinensis* are, for instance, most effective when massed.

From the lawn the grass path curves out of sight and runs parallel

to the main garden wall. The beds near the wall contain the graceful red and white single Fuchsia 'Madame Cornelissen', agapanthus, dieramas, etc., and on the other side of the path are Ceanothus 'Gloire de Versailles' (21), Hypericums 'Hidcote' and 'Rowallane', with Eucryphia 'Nymansay' to give height. The big wall has proved rather a problem. Walls are not good wind-breaks and the east wind jumps over it. Choice of wall plants also has not been easy. Ceanothus have frequently been damaged, though big plants of *C. impressus* are now well established, as is *C. veitchianus*, though it suffers in some winters more than *impressus*. Bignonias require more sun heat to produce flower buds than they get in our climate. There are wistarias, a good form of *Clematis montana* and several forms of *C. montana rubens*. The most decorative and architectural of all wall plants seems to be *Magnolia grandiflora* 'Goliath', and there are young plants of it and of *M. grandiflora* 'Exmouth'. *M. soulangiana* 'Rustica rubra' and a good form of *M. wilsonii* are also being wall-trained. Chaenomeles 'Knap Hill Radiance' is good on the grey stone and has a long flowering season.

On reaching a fourteenth-century granite archway, the grass path turns west, widens to 6½ feet and runs through the bottom garden, which slopes away gently to west and south to another granite gateway, in front of a very tall lime tree outside the garden wall. Astilbes, hemerocallis, phlox and other good-natured perennials are massed in herbaceous borders on both sides of the path. At the narrowest point the grass path runs between a thatched barn and tower, both of the fourteenth century. These buildings, the gateways and walls give a medieval setting to the garden. The tower, up which goes a spiral granite stair, was the entrance tower of the old vicarage, a three-storeyed building demolished in the nineteenth century. Remains of the old building, such as granite mullions, dug up when trenching, have provided suitable supports for teak benches placed about the garden. From the top of the tower there is a bird's eye view of the whole garden. At the time of the dissolution of Buckland Abbey (hence the name of the village—Buckland Monachorum), the Abbot changed his cloth like the Vicar of Bray, became parish priest and moved to this house where he lived until his death. To the left of the tower on a steep slope are some *Rosa moyesii* and a *R.* × *pruhoniciana* (*hillieri*), flowers of which are well lit up when the sun shines down through them. Nearer the tower are two 12-foot syringas, *S. tomentella* (flesh pink) and *S.* × *henryi* 'Floreal' (pale lilac). Their feathery plumes are very effective against the grey stone of the tower. At the foot of the tower on the lower side is a spreading evergreen carpet of mossy saxifrage. On the upper (south) side, on the level of the first floor of the old house, clipped hedges of Cupressus 'Donard Gold' line a path on to the lawn; they combine well with *Clematis montana rubens* and wistaria on the tower (Fig. 99).

Beyond the tower, the garden broadens and lilacs are a feature. On the left, below a 5-foot retaining wall, is a line of *Syringa chinensis* and its varieties, and along a narrow bed on top of the wall a line of *S.*

persica and *persica alba*. Unfortunately, the excellent *S. microphylla superba* does not blend well with *persica* and has had to be planted elsewhere. It flowers profusely in May and has a worthwhile second flowering in August. At the back of the wide bed opposite, on the other side of the path, is a line of *S. vulgaris* varieties, single flowered being preferred to the heavy doubles. The dark colours of 'L'Oncle Tom', 'Etna', 'Souvenir de Louis Späth', 'Glory of Horstenstein' and 'J. de Messemaeker' have a good background in a line of three scented *Malus hupehensis* (*theifera*) which flower at the same time as the lilacs. This has proved to be the only reliable scab-free crab. Ten years after planting —in very poor soil—the trees are 18 feet high and 18 feet wide. In autumn their leaves turn a good yellow and there is a heavy crop of little cherry-like crabs, horribly bitter but much appreciated by blackbirds.

Other shrubs in the bottom garden are many kinds of deutzia, such as 'Contraste', *discolor major*, 'Montrose', 'Elegantissima'—all very happy and free flowering in West country conditions—diervillas, *Buddleia alternifolia*, *Genista cinerea*, *Rhus cotinus foliis purpureis* 'Notcutt's var.', with its rich purple foliage all the season, philadelphus and last, but not least, *Kolkwitzia amabilis*. When in flower this is one of the most graceful and beautiful plants in the garden. Around it are grouped blue *Polemonium caeruleum*, which blend well with it.

Such is the nature of this post-war garden, a new garden in an old setting, which gives it character and variety. In spite of failures with rose species and with some dry-climate plants, a very wide range of shrubs is being successfully grown. Owing to the very limited space available, the total area not exceeding two acres, the qualifying test for plants is necessarily severe. There is a continual search for the best forms of plants and ruthless destruction of poorer forms. I have only named a few of the shrubs grown—they number some 1,200 in all—but apart from trees, for which there is no room, most shrubs of merit are being given a trial. The task now is to retain as many of the best as space allows and to discard the rest as they become overcrowded. Rhododendrons are finding homes in new beds outside the garden in a paddock and old quarry to the west of the *Cupressocyparis leylandii*, which gives them full protection from the east, while more *leylandii* have been planted to provide shelter from the north-west.

Apart from the fun of making our own garden, we have enjoyed visiting many others, both in the West country and elsewhere, in search of ideas and interesting plants. I am very grateful to many owners of gardens who have generously allowed me to have plants of their own raising and taught me much. For tuition, my special thanks are due to HAROLD HILLIER and to his father before him, and to ARTHUR OSBORN, who has been my "shrub tutor" for more than thirty years.

PROPAGATION OF WOODY PLANTS BY CUTTINGS

RECENT RESEARCH AND ITS APPLICATION TO FRUIT TREE ROOTSTOCKS

R. J. Garner
East Malling Research Station

(*Lecture given on June* 3, 1958, MR. T. NEAME, V.M.H., *in the Chair*)

THE two modes of plant propagation, by seed and by vegetative means, whilst each resulting in increase have quite different effects. One of the attributes of seedlings is variation of individuals which may provide for improvement or deterioration. On the contrary, vegetative propagation multiplies the individual. It is the real basis of horticulture, enabling us not only to aim at perfection by selection but to perpetuate the advance at will, granting our choices everlasting life.

The art of vegetative propagation has been practised from the dawn of human history and many methods have been devised. Division at transplanting must have been one of the first, then preparatory treatment which we know as layering and, perhaps last of all, the taking of comparatively small pieces of the plant and setting these in other plants by grafting or in situations where they are able to develop to wholeness once again. This latter process we know as propagation by cuttings.

Of all the methods of vegetative propagation, that by cuttings is the most important and it is on cuttings that nurserymen and gardeners chiefly rely. Cuttings may be taken from any part of a plant be it root, shoot, or leaf, moreover each kind of cutting may be treated in many different ways. Some subjects appear to respond well to one technique and not to others, and this is understandable, but the irregular behaviour of cuttings over the seasons and under different hands has proved puzzling. To accept the idea that only some of us are "green-fingered" does not solve the problem. What we want to know is how to acquire such coloured paws at will. This has long proved an intriguing problem and it is still with us, though I hope to show that some advances have been made in recent years, not so much in craftsmanship perhaps but certainly in our understanding of the principles.

When considering the evolution of the gardener's art, a mere fifty years back is recent and therefore no apology is needed for beginning in 1912 with BAYLEY BALFOUR'S lecture given to this Society forty-six years ago tomorrow. BAYLEY BALFOUR considered that all plants can be propagated by cuttings "some easily some with more or less difficulty", and that the essence of propagation by cuttings consists in:

(*a*) maintaining adequate water-supply in the cutting until it is able to absorb for itself.

(*b*) applying stimuli to encourage water-absorbing organs and to promote the development of the shoot.
(*c*) securing adequate temperature and aeration at the rooting end of the cutting.

Please note that these " essences" are confined to the careful treatment of the cutting after it is "born" but we now know that the prenatal history of the cutting largely decides its behaviour in the nursery.

For many years BAYLEY BALFOUR'S work was the foundation for very many studies not only at Edinburgh but also in research institutes and gardens throughout the world. BAYLEY BALFOUR reminds us that his work was well laced, as it were, with the findings of others and he records in particular, his indebtedness to LAURENCE BAXTER STEWART, his skilful and enthusiastic propagator, the envy of his contemporaries and the terror of his student gardeners.

Advances in this field have invariably been preceded by team-work, first the gathering together of information and experiences, and then one or two testing their new ideas so that in turn they too contribute to the fund of knowledge. Thus, though this talk is given by me, and I alone am responsible for its inadequacies, any contribution it may make is the product of team-work and a lively interchange of ideas by many experimenters, working with a wide range of plants in very different climates.

In this respect I remember with gratitude the help and encouragement received over many years from the late MR. A. W. WITT, Associate of Honour of this Society and my predecessor at East Malling. Today my colleague DR. E. S. J. HATCHER and I are jointly concerned in the investigations and it would have been appropriate, though cacophonous, if he and I had given this talk as a duet.

The behaviour of cuttings depends upon many factors and the experimental approach is to concentrate attention upon a few of these at a time. This is necessary, at least as a preliminary, but it is only part of the work, for when the single factors have been studied the findings must then be related to all the rest. At East Malling we have found it convenient to group our studies under three heads, following the order in which the material is handled by the propagator (1).

(*a*) Source or internal condition when collected.
(*b*) Treatment between collecting and planting.
(*c*) Planting environment.

SOURCE OF THE CUTTING

When we collect our cutting we stand at the great divide. Nothing we can now do to that cutting can be more important than what has already occurred. Its future is largely patterned by its history. Some very ready rooting subjects will regenerate in almost any circumstances, provided they remain alive, but given optimum treatment each will behave according to its origin. It is well known that varieties vary

much in their rooting but the variation in rooting within a clone is not so generally appreciated.

When a woody perennial is grown from seed it goes through what has been termed a juvenile period or phase during which it is unable to flower. Cuttings collected within this period root particularly well; even the shyest, including the walnut, clove and pear. This ready regeneration extends to all parts of the young seedling, roots, shoots and leaves, its intensity decreasing with age and the onset of flowering. But alas, the ready propagation of young seedlings, before we have been able to assess their value when mature, is of little practical use. It is only within the last twenty-five years that ready regeneration has been recognized as an attribute of juvenility and there is now an active interest in the possibility of returning a mature plant to a state resembling the juvenile, at least in its capacity to root. Some success has been claimed following the alteration of mature leaf-form by grafting with a juvenile scion. What is of more direct interest is that, in certain cases, shy rooting cuttings are made to root by grafting them with seedlings.

Somewhat akin to the rooting of cuttings taken from young seedlings is the high regenerative capacity of organs arising adventitiously, whether shoots on roots (2), shoots on adventitious bodies termed sphaeroblasts (10), or roots newly arisen from stems (6). We have observed that roots arising adventitiously on vegetatively propagated apple rootstocks make excellent cuttings but, as in seedlings, rooting propensity declines with age of establishment. This resemblance to the seedling in regenerative behaviour strongly suggests that adventitious origin whether of root or shoot involves a measure of rejuvenation.

Whether the high rooting potential of the juvenile and the adventitious is bound up with innate vigour we have yet to prove but there appears to be a correlation between vigour of the parent shoot (12, 13) and rooting of the cutting taken from it, even when vigour is induced by a vigorous rootstock (5). Again, it is now widely held that the best cuttings are obtained from severely pruned plants. At East Malling it was shown that shoots taken from layer beds made excellent cuttings but that annually pruned hedges were the most practical source (3). We know that vigour is opposed to ripeness; a vigorous plant retains its leaves longer in the autumn and flowers less profusely than a less vigorous plant. In a sense it is less mature, and it roots better. However, it may be more tender and sensitive to other influences, as a cutting it demands more nursing. This is well seen if we follow the life-history of a shoot through the growing season. In the spring it is tender, and as a carefully nursed softwood cutting it is quick to root, but also quick to die. In summer it becomes semi-lignified and in this state it roots more slowly and requires less nursing. When fully grown the shoot becomes even less sensitive, slower to root and more tolerant of its surroundings. High rooting potential goes with vigour and immaturity but such material needs careful nursing. This is quite contrary to the recommendations often given in the past which were to use

well-ripened shoots with a high carbon/nitrogen ratio. This seeming contradiction has arisen because of the confusion of rooting potential with survival. The well-ripened cutting, being relatively insensitive, was able to survive, whereas the vigorous immature sensitive cutting died before it could root. So we must compromise. If we have suitable controlled environments such as propagation cases with bottom heat, or mist installations, we would do well to have the most sensitive cuttings possible. These we can obtain by hard pruning the parent plant to obtain an abundance of vigorous non-flowering shoots. In practice we should cultivate special stock plants as individuals, or in hedges (Fig. 106), clipped free of flowering shoots. Such plants are not the most beautiful and inevitably the propagation project is kept in the background. It is indeed well that it should be a separate project for it has an interest sufficient in itself.

TREATMENT BETWEEN COLLECTING AND PLANTING

Having collected material from the parent, propagators generally exercise considerable care in the so-called "preparation" of the cutting. Whilst this is commendable there is little evidence that the shape or quality of the basal cut, for example, is of much consequence. In softwood cuttings the position of the basal cut in relation to the nodes, may be generally disregarded. The provision of heels of older wood in semi-lignified or hardwood cuttings aids survival and in an adverse environment may be the only means of obtaining satisfactory stands. It has been shown that the heel should be small and it is suggested (2) that its chief attribute is that it makes certain the base of the shoot is used, a region of comparatively ready root emergence.

Wounding the base of a cutting has been shown to aid rooting particularly of hard-wooded subjects. This good effect probably arises partly by stimulation of cell division and in part by the removal or disturbance of fibrous tissue.

It has been suggested that certain kinds of leafy cutting should be allowed to wilt before setting but generally the less wilting that occurs the better and therefore morning collection of cuttings is advocated.

As the growing season advances shoots may be long enough to yield a number of cuttings but cuttings from the lower portions of the shoot will be slower to root, though less likely to die. So the choice of a cutting may depend on the nursing available.

In the autumn the ripening shoots shed their leaves, and wilting is no longer a danger, but the shoot retains its character of being sensitive towards its tip where it is younger and relatively insensitive at its base (4). So when making cuttings we keep the upper and lower cuttings separate for they may react differently to given treatments, e.g. growth substance application and environment.

A convenient way to apply growth substances is in an alcoholic solution in which the basal inch or less of the cutting is dipped momentarily, commonly known as the quick-dip method (7, 9). We have found

FIG. 93—A scene in MONSIEUR MARNIER-LAPOSTOLLE's Botanic Garden of Les Cèdres, at Cap Ferrat on the Côte d'Azur, showing the tropical effect that has been produced with palms and tree ferns

FIG. 94—The terraces with barn in foreground and the old tower at The Garden House, Buckland Monachorum

Photos, J. E. Downward

FIG. 95—The upper terraces with rhododendrons, laburnums and upright cypresses

FIG. 96—Top terrace with laburnums and azaleas

Phot., J. E. Downward

FIG. 97—The western windbreak with × *Cupressocyparis leylandii* planted 1951 with recent rhododendron planting in front

Photos, J. E. Downward

FIG. 98—*Lilium regale* and the fourteenth-century granite arch

FIG. 99—Cupressus 'Donard Gold' and the old tower now covered with creepers (see p. 333)

Photos, J. E. Dolamore

FIG. 98—*Lilium regale* and the fourteenth-century granite arch

FIG. 99—Cupressus 'Donard Gold' and the old tower now covered with creepers (see p. 333)

Photos, Douglas Elliott

THE GARDENS AT PUKEITI

FIG. 100—The base of the giant rata *Metrosideros robusta*, with MR. ROBIN BAYLY, Curator of the Gardens (see p. 352)

FIG. 101—*Hemitelia smithii*, a fine tree fern growing naturally alongside one of the bush walks (see p. 351)

FIG. 102—*Victoria cruziana* in the Botanical Garden of Les Cèdres, at Cap Ferrat on the Côte d'Azur (see p. 356)

Photo, J. E. Downward

FIG. 103—Cacti in the Gold Medal Group at Chelsea Show staged by Zentral-verband des Deutschen Gemuse, Obst-und Garten, Bonn, Germany

FIG. 104—*Tulipa kaufmanniana* 'Fritz Kreisler' in the Keukenhof Bulb Gardens, Holland (see p. 347)

FIG. 105—*Begonia serratifolia* in MR. MAURICE MASON'S Gold Medal Display at Chelsea Show (see p. 357)

FIG. 106—Hedges established to provide large quantities of shoots for cuttings also give shelter to the nursery. This hedge of apple and plum rootstocks is in its third year from planting (see p. 338)

Photos, East Malling Research Station Studio

FIG. 107—Nursery beds of cuttings taken from winter-storage bins in March, photographed in June. Plum rootstock cuttings on the left, apple on the right (see p. 341)

a standard dip of ½ mg. of indole butyric acid in 1 c.c. of 50 per cent ethyl alcohol suitable for many moderately sensitive cuttings. Hardwood cuttings of shy-rooting subjects are given a "heavy" dip of 2½ mg. per c.c. Numerous experiments over many years have demonstrated the value of growth substances not only in hastening and increasing rooting but also in procuring reasonable stands of cuttings in otherwise recalcitrant varieties.

Temperature treatments, though administered between taking and planting, will be considered in the following section.

PLANTING ENVIRONMENT

Cuttings of actively growing leafy shoots have to be kept turgid by placing them either in a very moist atmosphere in a propagation case, or by maintaining a film of water on their leaves under mist sprays. Under either of these conditions the degree of rooting will be governed first by the nature and origin of the cutting and second by the growth substance treatment given. However, speed of initiation and development of roots will be markedly affected by the temperature of the medium. Such effects are well known to propagators but what has not been appreciated is that all cuttings are governed by these rules, though the less sensitive hardwood cutting will naturally react more slowly.

At East Malling we were much puzzled by the variable behaviour of cuttings of a given source planted in similar soil year by year. An examination of seasonal climatic conditions revealed that the rooting of autumn-planted cuttings was far better when the soil was warm in early winter than when it was cold. So we made some storage bins (11), or frames, holding a mixture of equal parts of peat and coarse sand and provided with electrically heated wire, thermostatically controlled to operate when the temperature fell below 45° F., the chosen minimum based on the soil temperature of our favourable seasons. The procedure is to collect and treat cuttings in October or early November, place them in controlled storage for the winter and plant them in the open nursery in late February or March. As in all our studies, we found that the effects of one treatment, in this case storage, depended upon other factors, notably source and growth substance treatment (4).

The application of warmth is a sensitizing treatment and overstimulation may be followed by collapse when transferred to open soil. The aim, therefore, is to provide a heating régime that will provide sufficient stimulation but not too much. The desired product is a cutting beginning or about to root as it leaves the store. A cutting in this condition will tolerate a wide range of soil conditions, for it is now no longer a cutting, in the true sense, but has already acquired wholeness for it possesses both potential roots and shoots. Cuttings leaving storage at the end of the winter, when the danger of severe frost has passed, may be planted less deeply than in the autumn so improving the shape of the resulting plant and providing for easy lifting from the nursery.

Little has been said about rooting media. From a study of the work of others, and tests of media of differing quality, for softwood cuttings, it seems that provided they are well aerated yet moist, a very wide range of materials may be used without markedly affecting regeneration. Cuttings rooted in sand alone may, however, prove difficult to transplant, whereas they are readily moved from a mixture of peat and sand. The relatively minor importance of the soil environment for hardwood cuttings has been shown by a comparative study of hardwood cuttings, including several varieties and cultural sources, in various soils (8). This showed that good soil environment alone did not effectively improve the performance of the shy-rooter, but that there were still striking contrasts not only between clones but between portions of shoots used as cuttings, once again demonstrating the potent influence of source.

THE INTERPLAY OF FACTORS

Whilst we have found it convenient to group factors so that we can consider and compare their effect we must avoid being misled into thinking that this or that treatment is a panacea. The perfect source, or treatment, or environment, will not alone bring success. Each will be effective in relation to the others. The over-sensitive softwood cutting requires little or no further stimulation, but needs superlative nursing. The less sensitive harder cutting should be further sensitized by growth-substance treatment and then given a modicum of nursing. An insensitive hardwood cutting must be given growth substance, and sufficient time in a favourable environment for initiation and development of roots. We must consider all the factors, since a cutting is not only influenced by its variety and source, its treatment, and external environment but is powerfully affected by the manner in which these separate factors interplay.

In propagation by cuttings we see that there are some general rules of wide application, but their employment remains an art. A detailed description of appropriate treatments for each subject is not practicable but some examples may serve to show the principles in action.

APPLICATION

Here I would like to take apple root stocks as our subject and handle them in three ways, by root, softwood, and hardwood cuttings.

Root cuttings are best taken from newly established plants because we know that roots which have most recently developed make the best cuttings, provided they are of reasonable thickness to survive planting in open ground (6). The cuttings are best collected and prepared in the autumn, to give time for bud initiation before the spring. Roots soon lose moisture when exposed and should be buried or stored in moist material and protected from frost. The cuttings are planted in spring when care is taken to set them upright with their apical ends just covered with soil. Any variation of planting depth affects establishment

adversely (14). Deep planting, or exposure, is deleterious. However, if planted under glass the ends should project above the medium.

Unlike either root or hardwood cuttings softwood cuttings are in active growth and must be kept growing. They require adequate moisture, temperature and light. Vigorous plants provide the most ready-rooting cuttings but extremely sappy shoots tend to rot before they root, though their survival is greatly increased by the use of mist.

Softwood cuttings normally include the tips of the shoots and are 3 or 4 inches long. A convenient method of collecting is to take them direct from the plant with an internodal cut, dropping them into a box lined with moist material. No leaves are removed. The basal ½ inch of the cutting is momentarily dipped in an alcoholic solution of a growth substance. The cutting is then planted not more than an inch deep in a mixture of equal quantities of peat and coarse sand in a closed propagation case or under mist. Bottom heat (round about 70° F.) is essential for quick rooting. This begins in a few weeks and the cuttings are gradually hardened off for planting in the open. We have found it convenient to root softwood cuttings in fibre pots, when under mist, to minimize disturbance at transference to the open nursery.

Softwood cuttings of apple rootstocks have been slow to attain size and require a further season in the nursery before lining out for working.

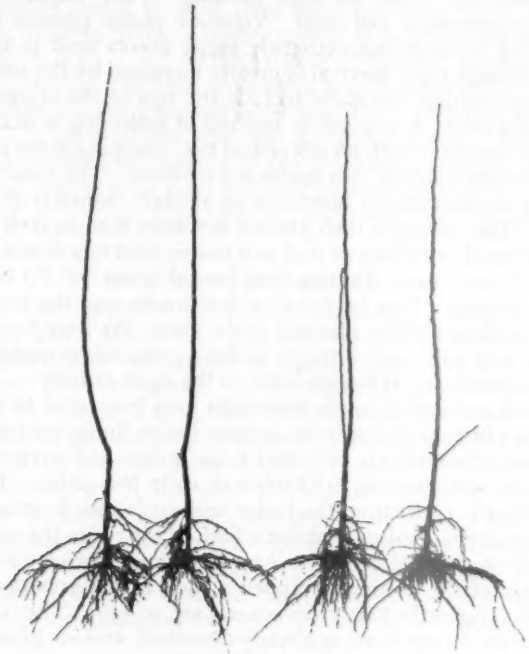
Hardwood cuttings are collected from hedges and prepared at the end of the growing season, in October or early November. The whole yearling shoot is taken from the hedge and made into lengths of a foot or so by cutting immediately above a bud. This cut is the apex of one cutting and the base of the next. Any remaining leaves are stripped off and the base of the cutting is dipped 1 inch in the growth-substance solution (for apples the heavy dip is used, see p. 339). The cuttings are now placed in storage bins, as already described, and are planted out in early spring directly the soil is workable. The cuttings are set thickly (2 inches × 6 inches) in nursery beds (Fig. 107) and in the following autumn the majority are fit to line out for working.

The primary aim is to establish the cutting as a new individual but it is also important to obtain a plant of suitable size and shape. The shrub propagator requires a compact bushy plant; in contrast the rootstock raiser prefers a plant of moderate size with an erect stem, and little or no branching (Text Fig. 1). Rootstocks of rapid growth and spreading habit may be modified by planting hardwood cuttings very close together so that the new shoots grow more upright and coarse growth is prevented.

Another way to achieve quality is to adjust the length of the hardwood cutting to suit subsequent working in the nursery. Long cuttings permit budding on the original stem; short cuttings are preferred if the new growth is to receive the scion.

So, there are many ways of using cuttings to multiply our plants. The choice of any particular method should be governed by the nature of the plant and the nursing facilities available. Of all systems, the

hardwood cutting commends itself not only to propagation on a field scale but also to the amateur who collects his cuttings from far and wide as opportunities arise.



TEXT FIG. 1—Hardwood cuttings of apple rootstocks collected in autumn, winter-stored, planted in March and lifted in November. Malling Crab C on the left, Malling/Merton 104 on the right (see p. 341).

REFERENCES

(1) GARNER, R. J. (1944). "Propagation by cuttings and layers. Recent work and its application, with special reference to pome and stone fruits", *Imp. Bur. Hort. and Plant. Crops. Tech. Comm. 14*, p. 80.
(2) — & HATCHER, E. S. J. (1948). "The selection of hardwood stem cuttings of an apple rootstock", *Rep. E. Malling Res. Sta. for 1947*, 71–5.
(3) — & — (1955). "The influence of source and growth substance on the behaviour of apple and plum cuttings", *J. Hort. Sci.*, **30**, 116–28.
(4) — & — (1957). "The interplay of factors influencing rooting behaviour of shoot cuttings", *Rep. 14th Int. Hort. Congr., Netherlands, 1955*, 204–14.
(5) — & — (1957). "Rootstock effect on the regeneration of apple cuttings", *Rep. E. Malling Res. Sta. for 1956*, 60–2.
(6) — & — (1958). "Aspects of rootstock propagation. V. The behaviour of root cuttings from plants of different age of establishment", *Rep. E. Malling Res. Sta. for 1957*, 57–61.

(7) HATCHER, E. S. J. (1949). "The use of growth-promoting substances in the vegetative propagation of plants", *Ann. Appl. Biol.*, **36**, 562–6.
(8) —, DE BOER, S. & GARNER, R. J. (1955). "The influence of soil environment on the behaviour of apple and plum cuttings", *J. Hort. Sci.*, **30**, 268–81.
(9) — & GARNER, R. J. (1951). "Aspects of rootstocks propagation. II. The development of the concentrated dip method of treating hardwood cuttings with growth substances", *Rep. E. Malling Res. Sta. for 1950*, 116–21.
(10) — & — (1955). "The production of sphaeroblast shoots of apple for cuttings", *Rep. E. Malling Res. Sta. for 1954*, 73–5.
(11) — & — (1957). "Aspects of rootstock propagation. IV. The winter storage of hardwood cuttings", *Rep. E. Malling Res. Sta. for 1956*, 101–6.
(12) SINGH, S. M., GARNER, R. J. & HATCHER, E. S. J. (1957). "The behaviour of softwood cuttings of apple in the open under intermittent mist and in a closed propagation frame", *J. Hort. Sci.*, **32**, 239–47.
(13) —, — & — (1957). "The influence of source and environment on the performance of apple leaf-bud cuttings", *J. Hort. Sci.*, **32**, 248–53.
(14) WAY, D. W., HATCHER, E. S. J. & GARNER, R. J. (1955). Aspects of rootstock propagation. III. Experiments with root cuttings", *Rep. E. Malling Res. Sta. for 1954*, 67–72.

SOME TULIPS AT THE KEUKENHOF EXHIBITION

Bram Warnaar

AT the request of the Editor, I committed myself some few months ago to "compile a few notes on some of the tulips at the Keukenhof exhibition". In case not all the readers of this article have seen the Keukenhof, let me begin with a few words about "the most glorious display of flower bulbs anywhere in the world". Although I fully endorse this statement I doubt whether I would have dared to use such bold words were this not the undivided opinion of well over half a million people who visit this annual event during April and May. And this general consensus is from people from all parts of the world. The Keukenhof is part of a famous old estate. We held our first show there in 1950. The total area is about 65 acres, only about half of which was used the first year. Expansion however was necessary far sooner than was first anticipated and practically all of the 65 acres are now in use and there is a waiting-list of firms anxious to get in. Enormous improvements have been made since we first opened and, where possible, further improvements are still being made. The Keukenhof is a private enterprise, run by a handful of enthusiastic bulbgrowers on a non-profit basis—all the profits being put back into the show to try and make it still more beautiful and perfect. During the first few years all bulbs were planted outdoors only but the need for a large glasshouse, where bulbs would flower earlier than those planted outside, was soon apparent and in consequence a house was put up where some 50,000 tulips are planted in the ground. This is a house which can be heated and is such an enormous success that two years ago a second house was built. This however is unheated so that now we have a sequence of

flowers under glass lasting several weeks. Apart from this a large so-called pavilion was built where we demonstrate the art of floral arrangements. This, too, is a very popular feature. The exhibition this year opened on March 29 and it certainly was a good thing that we had so many tulips planted under cover as, on account of the long and late winter, there was very little in flower outside. It remains for me to say that apart from the 65 acres of flower bulbs we have three car parks, totalling 25 acres, and which on busy Sundays and national holidays are practically full of cars from early in the morning till late afternoon. I hope that I have given you some idea what the Keukenhof is like and can now commence my notes on the tulips. I will begin with those varieties which were planted under glass. On the opening day the most spectacular was no doubt the Darwin Hybrid 'Holland's Glory', orange-scarlet shaded salmon, and which, although large when grown outside, can grow to an immense size under glass. This applies to practically all the tulips planted inside and especially when outdoor weather conditions are not ideal, the difference is enormous. In the glasshouse were planted most of the other Darwin Hybrids now in commerce. Flowering together with 'Holland's Glory' was 'Dardanelles', a large cherry-red. 'Red Matador' flowered a few days later and is a beautiful carmine, flushed scarlet and edged vermilion. It is not quite so large as most of the other hybrids but an ideal plant and inasmuch as it is in the more "economic" price-class, it is rapidly becoming very popular. 'Franklin D. Roosevelt' is a large brilliant orange-scarlet. So are 'General Eisenhower' and 'Parade', the latter being one of my favourites as the flower is perhaps a little more substantial than some of the others. Another one I like very much is 'Lefeber's Favourite', not quite so large as the former three but of a glowing scarlet colour not found in the other larger types and with a strong ideal stem. Perhaps the most popular one in this class just at present is 'Apeldoorn', a medium-sized orange-scarlet. With the exception of 'Holland's Glory', which has a black base, and 'Lefeber's Favourite', the base of which is yellow, all those mentioned have a glowing black base edged yellow and when the flowers are fully open this is a grand sight.

Of the Darwin Tulips under glass, and given in the order in which they flowered, I must begin with 'Mamasa', a beautiful buttercup-yellow on a good stem. 'Paul Richter', geranium-lake, is not only an excellent forcer but also a good garden variety. 'Red Supreme' is a large bright red on a tall strong stem. 'Anjou' is canary-yellow edged buttercup-yellow and I would say is one of the most beautiful yellow Darwins we have today. It has a strong stem, not too tall, and is an ideal garden plant. One of the most beautiful white Darwins is 'White Standard'. This is absolutely pure white without a trace of colour in the centre. The stamens are yellow and therefore there is no danger of discolouring after rain. It is medium-tall and has a strong stem. 'Pandion' is purple with a white edge and alone in its

class, with a good stem and is a fine garden plant. 'Dorrie Overall' is dark petunia-violet edged mauve and is a medium-large flower on a good stem. 'Andalusia' is a medium-large, deep scarlet-red and one I liked very much. 'Sweet Harmony', not exactly new but still outstanding, is lemon-yellow edged ivory-white and has a good strong stem. I like it better than the sport from 'Niphetos' called 'Silver Wedding', which is after the style of 'Sweet Harmony' but not quite so distinct. 'Cream Star' is creamy-white and a very lovely tulip. 'Rosy O'Day' is what I would call an improved 'Dresden China' and certainly a very pretty soft violet-rose. One of the darkest golden-yellows was 'Shanghai', a colour reminding me of the old Cottage Tulip 'Walter T. Ware'. Another beautiful dark golden-yellow is 'Golden Hind'. The medium-large flower is carried on a very strong medium-tall stem and I doubt whether there was any other tulip in the glasshouse with such substance. 'Arabian Nights', plum-violet flushed red, 'Scarlett O'Hara', geranium-lake, 'Snowpeak', pure white, and 'Nobel', dark geranium-lake, were about the last of the Darwins to flower in the heated house and were all equally attractive. So as not to lose sight of the "old timers" altogether, such varieties as 'City of Haarlem', 'Chas. Needham', 'Pride of Haarlem', 'Farncombe Sanders', 'Red Pitt' and 'Clara Butt' were also planted in this house, and when looking at them one fully realizes what enormous strides have been made during the last fifteen to twenty years. Although still nice, none of them can compare in size and general appearance with any of those I have mentioned.

I will now follow with the Triumph Tulips, of which there was rather a nice collection. The first to flower in this class was 'Oranje Zon' (Orange Sun). This is a large bright pure orange, quite the best orange tulip I have ever seen. I was rather surprised that the official classification is under Triumph Tulips, as in size, length of stem and general appearance it could well fit in the Darwin Hybrid class. 'Emmy Peeck' is a strong and robust deep lilac-rose and already well known as a good early-forcing tulip. 'Lucky Strike', a medium-sized flower, is a deep red with pale yellow edge. It has a good stem and is a very substantial flower. 'Dreaming Maid' is violet with a white edge and rather attractive. 'Balmoral' is glowing dark carmine-red with a good stem and is a nice plant. 'Arabian Mystery' is deep purple-violet and edged white. Not a colour of which I would like to see many specimens but nice in small groups. The stem could be just a little taller. 'First Lady' is reddish-violet and I should not be surprised if this is closely related to 'Emmy Peeck'. In the whites I preferred 'Blizzard'. Quite the largest white tulip I know and very substantial. The stem is medium-tall and very strong and I have no doubt but that this will become a popular variety. 'Airy' is a pale lilac-rose, an attractive flower on a good stem. 'Sulphur Glory' is aptly named. The colour is sulphur-yellow and this is an ideal variety both for bedding and forcing. 'Paris', orange-red with yellow edge, is already well known as a forcing variety but it was so beautiful here and lasted such a long time that I

must mention it here. I will end with 'Diorama', a large and very strong carmine-red tinged scarlet.

The Breeder class had a few excellent entries. Quite the best was 'Orange Delight', a clear bronze tinged orange. What a strong flower this is! The next to bloom was 'His Highness', similar in colour to 'Orange Delight' but much larger and taller although a little less refined. 'Caen' is pale bronze and tall and beautiful. 'Fulton' is a large purple with bronze edge and has a very tall and strong stem. I very much liked 'Reine Victoria', a glowing purple and reminding me of a large plum. In orange there were three entries, 'Olson's Favourite' and 'Papago', both already well known, and the newer 'Oklahoma', a very pretty and tall light orange. The last Breeder to bloom was 'Rayburn', a large violet with bronze edge and well worth waiting for. It is tall and with a strong stem.

The Cottage Tulips were well represented and several new varieties were much admired. 'General de la Reye', although not new, was the first out. It is a pale lilac-rose with shades of cream. 'Palestrina' is a lovely salmon-pink, a quite unique colour, medium-tall and with a strong stem. 'King Solomon' is a tall glowing mahogany and rather attractive. I very much liked 'Chinese Ivory', a beautiful creamy-white. 'Asta Nielsen' is no doubt a 'Mrs. John Scheepers' seedling. It is a good tall yellow, shaded sulphury-yellow. There were two sports of 'Advance', viz. 'Mirella', a deep salmon with paler edge, and 'Red Advance', which is salmon-red with scarlet edge. Both very good. 'Frasquita' is a light carmine edged vermilion and a nice oval-shaped flower. 'Ivory White' is, as the name implies, an ivory-white and very lovely. 'Renown', a large and tall light carmine-red, with slightly paler edge, was very good. 'Meissner Porsellan' is white with a clear rose edge. 'General MacArthur' is a tall and strong deep buttercup-yellow. 'Bonnie Lassie' opens sulphur-white and develops a narrow crimson edge as the flower ages. 'Balalaika' is glowing turkey-red and quite attractive. I have kept one of my favourites for the last, viz. 'Bond Street'. This is a sport of 'Wall Street'. It opens yellow but as the flower ages it becomes one of the most beautiful orange tulips I know.

The Lily-flowered were well represented although I could find only a few new ones. In this class 'Queen of Sheba' is of course still very outstanding in both size, shape and colour, shining brownish-red with orange edge. I liked 'Red Shine', a glowing deep red with a bluish base. 'Dyanito' is brighter red and although good, has not the same substance as the former. 'White Wings' is very similar to 'White Triumphator', but perhaps slightly larger. 'Orange Moon', not new, is still good although it takes time to develop the good orange colour. Still one of the nicest in this class is 'White Ensign'. It is a beautiful creamy-white and I do not believe that I have ever seen it lovelier. Of the Double Lates I will only mention a few. 'Gerbrand Kieft' is glowing purple with a white edge. A good strong flower on an excellent stem. 'Caro Mio' is clear rose. My favourite in this class was 'Garden Joy', a

beautiful orange-bronze. The stem is excellent and the flower has a lot of substance. 'Josemite', violet with white edge, I also liked and the same applies to 'Carla Luppi', a glowing pale red. A new double-white is 'Apis', although I could see little or no difference between this and the older 'Mount Tacoma'. The best Parrot Tulip, or rather the Parrot with the best stem, was undoubtedly 'Red Parrot', a dark raspberry-red. The flower is of good medium-size and carried well on a strong medium-tall stem. If the colour was a little lighter it would be much nicer still. The largest Parrot was 'Adventure', a sport of 'Advance'. A beautiful flower but the stem is unfortunately rather too weak and needs support to stand up.

Before finishing my notes of the tulips grown in the heated glass-house, I must mention *T. fosteriana* 'Purissima', a large and beautiful pale creamy-white which, provided the temperature remains rather low, lasts a long time.

I would now like to take you with me through the Park and where about mid-April, notwithstanding the late winter, there was a good deal of colour. Apart from daffodils, crocus, *Anemone blanda*, large drifts of *Puschkinia libanotica*, scilla, chionodoxa, etc., large and beautiful collections of Kaufmanniana tulips were a feast for the eye. The first to demand attention was 'Streza', and what a beauty this is! In order to be seen at their best a lot of the Kaufmanniana varieties must be fully open. 'Streza' does not require this and its bright red and yellow is sufficiently attractive even when the flower is tightly closed on cold days. 'Lady Rose' is rather tall and is a lovely pale rose flushed scarlet. 'Berlioz' with its mottled foliage I prefer when fully open. The outside is red and yellow but inside it is a very pretty lemon-yellow with golden-yellow base. 'Fritz Kreisler' is another of the taller ones (Fig. 104). The exterior is mauve and sulphur-yellow and inside it is a deep pink with carmine blotched yellow base. 'Gaiety' is rather short. It is uniform creamy-white inside while the outside is violet and creamy-white. One I liked rather a lot is 'Duplosa'. This is the only semi-double in this class as far as I know. It is a uniform raspberry-red with a yellow base and certainly resembles a small water-lily when fully open. 'Vivaldi' is another one with mottled foliage. It is a yellow edged carmine-rose and sulphur-yellow inside. 'Edward Grieg' is a beautiful orange-scarlet and I would call this an improved 'Scarlet Elegance'. 'Goudstuk' is just a little too large for my taste. It is a deep carmine and gold and has more the characteristics of a Single Early Tulip. Nevertheless it is beautiful and very substantial. 'Edwin Fischer', a short-stemmed one, is carmine and lemon-yellow and inside lemon flushed red. 'Ancilla' was another beauty. Very dwarf growing and pure white with a red ring in the centre when fully open. The exterior is flushed pale pink.

No sooner are the Kaufmannianas at their best than the Fosterianas also begin to demand our attention. Some I liked very much included 'Alpine Glow', a tall strong plant with large flowers. The exterior is carmine and pale yellow, while the inside is amber-yellow on a black

base with red blotches. Very effective. 'Humoresque' also is carmine and cream, and pale cream inside, also on a black, red-blotched base. 'Purissima' I have already mentioned and it certainly is beautiful. 'Albas' is a dull rose and silvery-white inside. The following four varieties, 'Spring Pearl', 'Glamorous', 'Solva' and 'Delicacy' were all very pretty but a little too much of the same colour and all more or less raspberry-red. In type and build they seem closely related to 'Red Emperor'. One of the most beautiful Fosterianas was undoubtedly 'Tender Beauty', unfortunately only when fully open, but when at its best I know of none nicer. It is a large, clear, bright, rosy-red and white on a tall stem. As I said, it must be seen when fully open as otherwise the colour is too pale.

I now come to the *greigi* varieties—and what lovely entries there were! My favourite by far is 'Plaisir', a dwarf-growing type with mottled foliage. The colours are shades of vermilion-red and carmine, broadly edged sulphur-white with a black and yellow base. Another dwarf type which I liked very much was 'Donna Bella', also with attractive mottled foliage. It is carmine, edged cream, and creamy-yellow inside on a black base with scarlet blotches. 'Yellow Dawn' is very tall. It is orange and gold and uniform indian-yellow inside on a dark base. 'Zigeuner', with slightly mottled foliage is medium-tall and solid orange-scarlet. 'Rosanna' is another short one. It opens red, flushed cream, but the creamy colour becomes a lovely shell-pink when the flower ages. Very pretty indeed. 'Tango' is another tall one with slightly mottled foliage and is a beautiful deep orange-scarlet. I will end this selection with 'Dreamboat', rather short with mottled foliage and a beautiful amber tinged red.

After the *greigi* varieties the Darwin Hybrids almost dominate the scene and I have already described them. Two I did not see planted inside were 'Canopus', a slightly larger 'Red Matador' and 'Mayno'. This is quite distinct from all the other hybrids and is beautiful dark lemon-yellow.

Immediately after the Darwin Hybrids there is such a large collection in bloom, both in the cold house and all through the grounds, that, also in order not to make this article too long, it is only possible to mention some which I particularly liked. And then of course only those varieties which I have not already mentioned as flowering in the heated house. A few of the Triumphs, which were very good, are 'Jamaica', orange flushed magenta; 'Morning Kiss', white with a pure carmine-red edge; 'Stradivarius', red flushed cerise, a colour very much like the old Darwin 'Afterglow'; 'United Europe', red edged yellow, was an excellent bedder. So were 'Olaf', scarlet, and 'Makassar', dark canary-yellow. The latter was well represented and very good indeed.

In the Darwins I particularly noticed 'Ace of Spades', purplish-black; 'The Archbishop', a deep purple sport of 'The Bishop'; 'Elizabeth Eriksson', a lovely lavender-blue; 'Baronesse van Heekeren', glowing scarlet; 'Excellent', light carmine-red flushed scarlet. 'Flying

Dutchman' is a large vermilion-scarlet on a tall stem. 'Queen of Bartigons', salmon-pink, was lovely and so was the other 'Bartigon' sport 'Montgomery', white edged red when first open and slightly flushed red when ageing. This however is classed as a Rembrandt Tulip. 'Notre Dame', light carmine-purple, was very good and strong and last, but not least, 'Regalia', a beautiful large pure white on an excellent stem.

In the Cottage Tulips I liked 'Magier'. It opens white with a small violet edge and becomes flushed violet-blue as the flower ages. I like it best when not too old. 'Gold Rush' is a dark yellow sport of 'Mrs. John Scheepers', while 'Falstaff' is a dull red, edged bright red. 'Ivory Glory' is amber-white on an excellent stem.

In the Lily-flowered, 'Royal Baby' is very pretty and alone in its class. It is white and carmine-red. 'Scarlet Flame', a good geranium-lake is not new but was most attractive here. A Breeder Tulip which much attracted me was 'Elisabeth Rawiser', glowing brownish-orange.

Practically all of those which I mentioned earlier in my notes as growing under glass were also planted in the open and where one could enjoy their beauty again, especially as outside bigger quantities were being used. Beautiful combinations were formed with tulips in large beds of forget-me-nots. Mauve forget-me-nots with mauve tulips; yellow, orange and pink tulips with white forget-me-nots, and red, pink and white tulips with blue forget-me-nots. One large planting of 'White Triumphator', with blue forget-me-nots, was particularly effective. I have not said anything about the Single and Double Earlies. The latter especially made a glorious show and were represented in every possible colour, both planted by themselves in large beds or in beautifully mixed borders.

And so I could go on for a long time still describing the beauties of this unique show-place, realizing all the time that words cannot do justice to what was to be seen. I would therefore like to finish by saying that I have enjoyed writing these notes and hoping it may inspire the reader to come to Holland next Spring to see the Keukenhof.

PUKEITI AS IT IS TODAY

Douglas Elliott

PUKEITI is a reserve of 900 acres in the North Island of New Zealand, which is being made into what must be one of the world's most remarkable gardens. Today, a mere seven years since the project was started, it is very much in its infancy, for its planners, the members of the Pukeiti Rhododendron Trust, while providing for immediate beauty and interest, are looking well to the future and have the space and material for a hundred years of planting.

While the site was chosen primarily because it is so very well suited to growing rhododendrons, these are not by any means the only plants being used. All the best species and varieties of hardy and half-hardy shrubs and trees will be represented here, where the frosts are not severe, the light volcanic soil is acid and well drained, the rainfall is ample—about 10 feet a year—and the humidity high as a result both of the heavy covering of native trees and of the position—it is only a few miles from the sea and lies between two mountain ranges near the 8,260-foot Mount Egmont, an extinct volcano.

Pukeiti, pronounced *pooky*(like cooky)*eatie*, is the local Maori name, meaning "little hill", because it lies between two big hills. The hill is part of the original 153 acres bought by W. DOUGLAS COOK, ESQ., of Eastwoodhill, Gisborne, one of the Dominion's keenest plantsmen, after he had conceived the idea of creating a national rhododendron garden. When he offered the ground as a gift to a society to be made up of at least twenty people who should each subscribe an annual subscription of £50 for five years, there were some doubting Thomases who said he was making a safe offer and would never be called on to part with the land. But largely owing to the untiring energy of RUSSELL MATTHEWS, ESQ., of New Plymouth, the offer was enthusiastically accepted and MR. MATTHEWS soon rallied together more than the required number, not only locally but from all over the country.

In October 1951 the Pukeiti Rhododendron Trust was incorporated and in the following month the property was officially opened in the presence of about forty members and visitors.

The Trust's aim was to make Pukeiti a living treasury of rare and beautiful plants with, as its name implies, special emphasis on rhododendrons. Scientific study of rhododendrons would be encouraged, varietal distinctions would be watched with a view to standardizing names, and information about the genus would be disseminated. At the same time the property would be beautified and made a sanctuary for birds.

The growth since then has been spectacular. The membership early this year, 1958, was over 1,700, recruited from many parts of the world including the U.K., U.S.A. and Asia.

Locally the idea caught the imagination of many keen workers, not only gardeners, who have given so unstintingly of time and materials that a great deal of excavation, much of it with tractors and trucks, has been done at no cost to the Trust.

Gifts of land adjoining the original property have now brought the area to 900 acres. A handsome lodge, incorporating a residence for the curator, has been built, mainly by voluntary labour.

This is the keynote of Pukeiti: it is the result of giving of money, time, energy, and thought—and it neither asks for nor has received any Government grant. Nor does it sell plants. It is only recently as a result of the public wanting to visit the property, that a small admission charge is being made.

Pukeiti today is already beautiful; for it is clothed with native forest or "bush" as we call it here. Classified by the botanists as rain forest, it is virtually jungle with its thick and, in parts, impenetrable mass of lianes and shrubby undergrowth. Almost exclusively evergreen and mostly broad-leaf, it has had most of the big timber cut out of it but that was many years back and the scars are now covered with second growth.

The tree ferns always fascinate overseas visitors. Some of the mamaku or black tree-fern (*Cyathea medullaris*) are about 40 feet high but the prettiest are the soft-fronded *Hemitelia smithii*, which appear to be especially plentiful and healthy in this area (Fig. 101).

The bush is given a tropical appearance by the nikau palms (*Rhopalostylis sapida*), whose smooth green trunks soar up into the branched tops of the surrounding trees. The lianes or climbers include *Rubus australis*, a cousin of the blackberry, which is known as the bush lawyer because the passerby who gets entangled in its thorny embrace finds it hard to break away. Then there is the supple-jack (*Rhipogonum scandens*), a member of the lily family with long, extremely strong and elastic stems that are always ready to trip or trap the unwary tramper.

A very decorative climber that beautifies many an otherwise bare tree trunk is the kiekie (*Freycinetia banksii*), New Zealand's only member of the screw-pine family. The broad light green grass-like leaves in thick rosettes are in striking contrast to the other tree leaves amongst which they climb. The stems cling to tree trunks by means of aerial roots. But the plant's most unusual feature is its creamy white flowerhead which contains rather sickly-sweet edible bracts that are followed by a tasty conelike fruit. The many climbing ferns that cling closely to the trunks of trees and tree-ferns make their supports pillars of delicate green tracery.

The only deciduous native trees in New Zealand are the tree fuchsia (*Fuchsia excorticata*), *Gaya lyallii* and the closely-related plagianthuses (neither genus is represented naturally at Pukeiti though planted specimens are looking well), and the kowhai (*Sophora tetraptera*) which loses its leaves just before its golden beaklike flowers come out in the spring.

Evergreen forest is no place for a carpet of wild flowers; instead there is a dense and wonderfully varied mass of ferns, many of them the so-called filmy ferns (they are very thin and translucent) in large patches only a few inches high growing in the mossy earth and over fallen trees.

Two ferns are outstanding: the Prince of Wales's Feather fern (*Leptopteris superba*), which is sometimes claimed to be the most beautiful of all our 140 species of ferns, has very soft feathery fronds of a sombre green. Very old specimens sometimes have a trunk about 3 feet high. They thrive in damp situations. The horseshoe fern (*Marattia fraxinea*) has very large fronds on thick stems that may eventually be 5 to 6 feet long. At the base when you pull them from the plant is a swelling, shaped like a horse's hoof. The Maoris used to eat the large starchy rhizome. The plant is now becoming rare in the wild.

Among the very old trees that survived the axeman's blow for some reason or other—perhaps they were too inaccessible or were already showing signs of decay—are some tall rimus (*Dacrydium cupressinum*). In the young stage, up to 30 or 40 years, while it is thickly clothed with its pendulous branches and brilliant green leaves or scales, it is one of the most beautiful of our conifers and deserves to be planted in gardens much more than it is.

The rimu is often the host plant for an extraordinary epiphyte, the rata (*Metrosideros robusta*). Growing on the ground, the rata is nothing more than a much-branched shrub or small tree with a short straight trunk. But when one of the tiny wind-borne seeds lodges in the upper branches of some tall tree, such as the rimu, a very different pattern unfolds. The rata sends down to the ground long aerial roots which gradually thicken and join together to form a trunk, meanwhile squeezing the host tree to death. The fine specimen shown in Fig. 100 is somewhere about 150 feet high and 14 feet through at the base. Recently fourteen schoolboys packed themselves into the cave left in the base of the tree by the rotting of the rimu that used to support it. Now in its turn, the rata is becoming the host of climbing ferns, kiekie, and of other epiphytes high among its branches.

The scarlet flowers of the ratas are a feature of the New Zealand bush in December and January.

The kauri (*Agathis australis*), grandest of all New Zealand trees, does not grow wild so far south as Pukeiti but several that have been planted here are doing well and will in 20 to 30 years be a striking feature with their olive green leaves and definite columnar shape.

The most evident of the innovations at Pukeiti is the lodge, an attractive single-storey building with a large lounge for the use of members. It is reached by a short drive from the main road. A long terrace across the front contains a border in which alpines and perennials are doing well. Below is a large area of lawn. Looking across terrace and lawn from the lounge you see in the distance the summit of Pukeiti, which is reached from another entrance, along the main road, by a very pleasant and fairly easy walk. It is hoped eventually to develop this into a motor drive for the benefit of those who find the walk too much for them.

From the peak there is a magnificent panorama across the bush and the more distant farmlands to the blue Tasman Sea, 1,600 feet below, with the seaport of New Plymouth sprawling along its edge. The city, with a population of some 25,000, is 16 miles by road from Pukeiti and is the ideal centre for the visitor, because it has a fine park (with a good collection of rhododendrons), several excellent tree and shrub nurseries, bathing beaches, and is within reach of Mount Egmont where there is year-round climbing and winter ski-ing. The surrounding farmlands are one of the richest dairying districts in the country.

Radiating from the Lodge are many interesting walks, one of the most popular being to the waterwheel, which was built and installed by

the curator to supply water and electricity for the Lodge and the greenhouse. This walk branches off to wind through groves of trees and tree-ferns, mainly *Hemitelia* and on the bank sloping steeply to the stream are dozens of Prince of Wales's Feather ferns.

Some of the more open walks have been sown in grass which not only makes them more pleasant to the eye and to walk on but also reduces maintenance to an occasional mowing and protects them from erosion, which can be a serious problem where the soil is light and the rain often pours down with tropical violence.

Already many hundreds of rhododendrons and other choice trees and shrubs, including most of the Asiatic magnolias, have been planted out. The rhododendrons, many of which were imported direct from England, have been grouped in clearings made amongst the native trees, each group being of one species or variety. Most of them are making phenomenal growth, as much as two feet in a season, and in spite of this are forming flower-buds, which means that within three or four years there will be a worth-while display of colour.

The dawn redwood (*Metasequoia glyptostroboides*), which grows with staggering speed in this part of the world, promises to be one of the most beautiful conifers in the reserve. The deciduous trees, with their flowers, their autumn colours, and their bare winter stems, are going to lighten the somewhat sombre effect of the native evergreens, which in their turn will provide the perfect background.

A newly-opened walk is being planted out with the choicest deciduous azaleas. Hydrangeas do well in the open both because frosts are not severe and also because the frequent clouds save them from sun-scorch.

Lilies are being naturalized. Already the very easy-to-grow *Lilium formosanum* is coming up happily from self-sown seed. A certain number of herbaceous perennials are being used near the Lodge but they will be restricted because of their demands on labour.

The greenhouse, the recent gift of a few members, is in full use and has already produced many hundreds of rhododendron seedlings from imported seed.

The development of the area immediately in front of the Lodge has been delayed because until this year it was used as a nursery for the hundreds of bought and donated plants that needed attention while they were awaiting the preparation of their permanent homes in the bush, preparation that usually entailed the use of bulldozers for removing old tree stumps and tangled undergrowth. It is hoped this area will be landscaped in the winter of 1958.

One of the most heartening things about Pukeiti is the generosity and faith of its members. The only tangible return many of them get is the occasional illustrated newsletter telling them what is being done and possibly mentioning the growth of some of the plants. Those who are able to visit the reserve feel well repaid even though they may carry away only a memory of peace and green coolness.

Dozens of local members not only pay their subscriptions but give

each year many hours of devoted labour without which it would have been impossible to carry on. One retired farmer spends almost his whole time at Pukeiti and claims that this new interest has given him a new lease of life.

Nurserymen as well as private gardeners have been generous in their donations of plants. One of the latest gifts was some two dozen *Michelia doltsopa*. They have also been of great help in propagating rhododendron scions from overseas and camellia cuttings, including a collection given by MR. RALPH PEER, of Los Angeles.

And so it goes on and meanwhile Nature is making of these gifts a garden that is already outstanding in New Zealand and that seems likely to become world famous—Pukeiti, the "little hill" with the big future.

ORNAMENTAL AND UNCOMMON PLANTS FOR GARDENS OF THE CÔTE D'AZUR*

J. Marnier-Lapostolle

(*Associate Member of the Muséum d'histoire naturelle*)

BEFORE 1914 there were, between Cannes and San Remo, some beautiful botanic gardens whose owners and gardeners made a point of introducing new plants for the adornment of our beautiful country. We need only to bring to mind the names of some of these pioneers of plant introduction: THURET, the BROTHERS NABONNAND, EDOUARD ANDRÉ, DR. PROCHOWSKY, SIR THOMAS HANBURY at La Mortola, VIGIER, ROLAND GOSSELIN and others.

What remains of these gardens now? Very little indeed. The inspiration died with the originators; only the hardiest species survive. It would, however, be as well to go through all these estates that are on the verge of being divided up in order to make an inventory of the rare, often unique plants so as to protect them and prevent them vanishing for ever. When a small house is to be built nowadays there is no hesitation in destroying in a moment what has taken nature more than half a century to bring to perfection.

Since my childhood I have always been attracted by tropical plants, that is to say, those which do not look like the flora commonly found in the North of France and in Europe. What is more enchanting than to be transported in three hours by air or in one night by rail, from snow and frost into a garden which makes one forget them and gives one the impression of having arrived in the tropics.

Such gardens have gone out of fashion: Why? To be supplanted

* Translated by VERA HIGGINS, V.M.H., and reprinted from "Jardins de la Côte D'Azur", prepared by La Société d'Horticulture de Nice and des Alpes Maritimes for the XVth International Horticultural Congress, by kind permission of the author and of La Société Nationale d'Horticulture de France.

by others whose geometrical lines are contrary to nature and could be replaced by artificial plants. In fact, nowadays one does not look for "the plant" but for "the line" one can give it. Personally I am very fond of cypresses, but one does not want too many of them. . . .

On the other hand, to create tropical effects, graceful in form, flexible and unusual, use must be made of palms, bamboos, agaves, aroids, bromeliads and bananas, which give the Côte d'Azur its individual character. What do our gardens look like if these are omitted? Like any sort of garden in any of the colder regions.

In designing these tropical gardens one must make full use of palm trees. Some of them are widespread along the Côte d'Azur, such as *Phoenix canariensis* and *P. dactylifera*, *Washingtonia robusta* and *W. filifera* and *Butia*. Others are less well known although more resistant to cold, such as all species of *Chamaerops*, *Trachycarpus* and *Sabal*, as well as *Jubaea spectabilis*. Who has not admired the latter at the Villa Thuret? It is an imposing palm of the group *Cocoineae*, with orange-yellow fruits, while the skin of the trunk reminds one of the feet of an enormous elephant.

In the warmest parts of the Côte d'Azur, between Nice and San Remo, a very beautiful palm can be fully acclimatized, one of the group *Arecineae*, with lovely lines, the bunches of fruit arising at the intersection of leaves and trunk, being vermilion red in contrast to the ivory white of the raceme; this is *Archontophoenix cunninghamii*, better known in cultivation by the erroneous name of *Seaforthia elegans*. The latter is quite a different plant, much less resistant to cold, with the tips of the leaflets slightly laciniate. Do not forget the graceful palms *Chamaedorea* and *Rhaphis*; their trunks are about the size of a medium bamboo, which they resemble in form, but the leaves are carried like those of a palm tree. The clusters of fruit and their seeds are curious and of different colours, either jet black or coral red. They need a sheltered position, protected from full sun and cold.

After the cold weather, such as we had last year, only the kinds which make suckers will shoot again; the others are killed, unfortunately, unless they are in exceptional positions.

The uninitiated often mistake for palm trees plants which have existed since the carboniferous period and belong to an entirely different family, more closely related to the conifers in fact, that is, the Cycads. One of the best known is *Cycas revoluta*, found in many gardens; the male plant has elongated cones which open when ripe to let the pollen escape. The leaf, at flowering time, forms a cottony mass enclosing the ovules; when these are fertilized they develop into red fruits as large as a walnut.

In this family there are other plants which are rarer and less hardy, such as the African *Encephalartos*: *E. lehmannii* and *E. horridus*, with greyish blue leaves, *E. longifolius* and *E. caffer*, with green leaves. The Australian *Macrozamia*, with feathery green leaves, the American *Ceratozamia*, with gracefully arched, green leaves and the Mexican

Dioon: *D. edule* and *D. spinulosum*, with rigid leaves whose leaflets are variously displayed on the same plant.

When one designs a tropical garden one should not forget three of the *Araceae* which are not really affected by the cold except during unusually hard winters, such as that of 1956, and even then they were not killed. Nearly all made fresh growth from the base. One is *Monstera deliciosa*, with leaves a metre long and 60 cm. broad, notched along the edge and perforated within. The delicious fruit is like a pine-apple. It is a climbing plant like our ivy and like it, prefers to attach itself to a damp wall or the trunk of a tree to which its long adventitious roots adhere.

Raphidophora decursiva is curious in the way it behaves; if the plant finds no support, the stem between the leaves may become as much as 20 cm. long, but when it can cling to a tree, the internodes are less than one centimetre and the leaves then become four or five times larger than when the stem is unsupported.

Among my new introductions I would mention *Philodendron bipinnatifidum*, *P. sellowianum* and *P. giganteum*. These three species seem to require less support than the others for it is their roots which act as props to keep the plants erect. All need a rich soil, well manured and with plenty of water during hot periods.

Consider also the beauty of the bamboos with their feathery plumes, some of which reach a height of 15 metres. The stem of some species exceeds 15 cm. in diameter. Their colour is very variable, including the whole range of the greens, some being black, some bright yellow. Others such as *Phyllostachys castillonis* have green or yellow internodes which give these plants a very odd appearance. *Phyllostachys* is hardy while *Bambusa* and *Dendrocalamus*, which reach gigantic proportions, are less resistant to cold. They also have another disadvantage: they grow in the autumn and their stems are only moderately woody when the cold weather sets in.

On many tropical plants it is possible to arrange epiphytes such as orchids, bromeliads, *Platycerium* and *Rhipsalis* which are much "hardier" (an English word that has no equivalent in French but means that a plant will not die even if subjected to several degrees of frost).

Contrary to expectations all the *Ericaceae* such as azaleas, rhododendrons, etc., do very well on the Côte d'Azur provided the soil is lime-free and rich in leaf mould. The sight of *Azalea indica*, usually to be seen at the florist's, opening its brilliant clusters in the open air is really wonderful.

If one lays out ponds or lakes sufficiently large and open to the sun, *Nymphaceae* such as *Victoria cruziana* (Fig. 102) and *Euryale ferox* will do marvellously. These two species, despite their gigantic size, are annuals. Their seeds ripen and sow themselves at Les Cèdres. Who has not marvelled at the immense leaf of the *Victoria* (1·70 m. at Les Cèdres) with its raised edges and its veins, spiny and red on the underside; whose flowers, white, the first day, and pink, the second, may reach a

diameter of 20 cm., and has not regretted its short duration? They are replaced by new flowers about every three days.

Euryale ferox, with dark violet flowers, is spiny on the upper surface; it is not so large and its leaves are rarely more than 60 to 80 cm. across. *Nelumbo*, in various colours, raises its peltate leaves above the water to a height of 1½ m.; it is the Lotus of the Egyptians; its flowers may be red or yellow according to the species and its seeds are edible.

The tropical water lilies, *Nymphaea capensis*, *N. stellata* and *N. gigantea*, white, yellow or blue, only open their enormous and very lovely flowers during the day time. On the contrary, *Nymphaea rubra* opens only at night. Why should there be this difference?

The garden at Les Cèdres is a living proof of the effect that can be made of a tropical garden on the Côte d'Azur containing, as it does, some 15,000 different species including large collections of euphorbias, asclepiads, ferns, acacias, *Araliaceae* and bromeliads.

SOME BEGONIAS AT CHELSEA FLOWER SHOW, 1958

L. Maurice Mason

Begonia serratifolia (Fig. 105) was collected by the writer in the central highlands of New Guinea in 1954. A charming plant making a solid bush 2 feet high and as much through, it has, with its claret-coloured flowers and vivid deep pink spots on the wine-coloured leaves, become quite popular in collections of the genus.

What an easy, charming and diverse race the wild plants of the family are. Almost all of them ask for a minimum temperature of 45° F., shade from scorching sun, and to be watered sparingly in the winter months. Given these, surely not very difficult conditions, they will provide with their flowers, and brilliant and diverse foliage, a picture of more lasting beauty than most families of tropical plants. Divided as they are into four groups, the fibrous, tuberous, rhizomatous and bulbous, it is not easy to name the most outstanding.

My pride of place must go to that lovely and still undescribed plant known as the 'Iron Cross'. This was introduced by the writer to European and American cultivation six years ago, from Singapore, and is in my opinion undoubtedly a "good species", and is certainly one of the easiest. Here it has been nearly frozen, lost all its leaves, but has resurrected itself triumphantly in the spring. It does like a little more light than most begonias, when the full beauty of the leaves will be appreciated.

'President Carnot' is still the best of the old cane-stem varieties and its huge hanging heads of deep pink flowers are seen at their best if it can be allowed a free root run. *B. evansiana* is nearly hardy and

can be grown out of doors in many parts of England, the bulbils formed on the annually produced stems making it an easy plant to increase. *B. imperialis* var. *smaragdina* with its small round leaves of lime-green velvet is charming, but demands a higher minimum temperature than most, as does that superb hybrid 'Arthur Mallet', whose hirsute, almost royal purple, leaves are as gorgeous as any I know.

No mention has been made of the Rex varieties of which there are a legion. Almost any colour and shape and form can be found by diligent search in those florists who cater for the house-plant trade, but a word as to their care may not be out of place. If you grow them in your house keep them away from a south window; any other will do. Repot them in a standard mixture as may be necessary but keep them in shallow pans with plenty of crocks. They do appreciate feeding in the growing season and by no means be disappointed if all the leaves fall off in November. It is an even chance they will break again in the spring.

A list of the names of the begonias exhibited at Chelsea would be meaningless as many are perhaps of botanic interest only. Mention should be made of *B. vitichotoma*, with adventitious leaflets appearing on the large palmate green leaves, and of the double blood-red semperflorens variety 'Reddy'. These are outstanding and so is *peltata*, which as the name implies has silvery green felty leaves, and is a plant of great distinction.

Climbing begonias are many and several were shown, among the best being *B. scandens cordifolia*, with many clusters of orange flowers. *B. herbacea*, with leaves like a hart's-tongue fern, was among the more uncommon, but *B. crispula*, with leaves corrugated and wrinkled, was too precious to risk. For a brief season these species cannot vie with the gaudy large-flowered hybrids, but for interest throughout the year they stand supreme.

A large part of the pleasure of exhibiting these plants at Chelsea is the fun of meeting amateurs who are interested in the same family and exchanging plants with them. In this way we have assembled a collection which is not inferior to that of any Botanical Garden in the country today, and in which no plant has been bought.

NOTE FROM A FELLOW

Pink Meconopsis

IN "Notes from Fellows" (p. 122 of March JOURNAL), my husband and I were much interested in the letter from MR. H. G. LYALL on *Meconopsis nepalensis*, pink, and his experience in growing and flowering this splendid plant, and we thought it might interest members to hear of our experience in growing this meconopsis and others of the genus here in British Columbia, as it appears we have more success and produce a finer plant than has been done in England. I obtained seed of

M. nepalensis (pink form) in 1955 from a fellow R.H.S. member, who received it from the 1954 S.S. & W. Expedition. By the summer of 1957 I had fourteen plants, all of which flowered at an average height of 6 feet—one of them 6 feet 6 inches—and the winter rosettes 18 inches across. There were seventy to eighty flowers to a stem, of a brilliant rose-pink, with one exception, which bore flowers of a much deeper rose; there was no sign of colour fading from sun-bleach though the plants had very little shade. First flowers opened on May 27 and there was still plenty of bloom at the end of August. Quantities of seed set and ripened, which I sowed immediately, and now have hundreds of seedlings of both the rose and deep rose. Seed has been kept in cold storage and germinates quite satisfactorily the second year.

My husband and I are growing some eighteen varieties of meconopsis, seed of which we obtained originally through the kind offices of DR. JOSEPH F. ROCK. These include *M. regia* (red and yellow form), S.S. & W. 3996 Nep, S.S. & W. 8620, 8621, 8459, *gracilipes*, *paniculata*, *violacea*, *aculeata*, *horridula*, *quintuplinervia*, *superba*, *grandis*, *integrifolia*, *betonicifolia*, *wallichii* and *nepalensis* (pink). Of this last-mentioned I shall this year be flowering plants grown from seed sent me by MAJOR SHERRIFF, and it will be interesting to compare results with our former strain.

In MR. LYALL'S final paragraph, he speaks of *M. nepalensis*, pink, as "almost certainly mono-carpic". This is not invariably the case, as I noticed two of mine which flowered well last summer had formed new basal rosettes; I therefore removed the flower spikes before seed was formed and the rosettes have wintered through well, are a good size and will flower this summer.

I have this year flowered two unidentified meconopsis from the S.S. & W. source, for which I have no numbers.

No. 1 grew to 3 feet high, has the leaf of *superba*, flowered during April and May. Individual flowers were a Lavender pink, similar in size, form and habit of growth to *nepalensis* pink, seed capsule of which also resembles it. A possible Hybrid of *grandis* and *superba*?

No. 2 sent up a magnificent flower spike, which is 8 feet high by actual measure, from an immense very finely cut winter rosette, densely covered with long silver hairs, far more silvery than *wallichii* and with only a faint trace of golden down on the buds. The blooms are a rich crimson, as large as a *nepalensis*; inflorescence resembles *paniculata* and there are literally hundreds of buds, by actual count, of which about thirty have now opened. Showed colour about June 1. This is one of the handsomest of the genus I have ever seen.

MRS. H. C. DALZIEL

Cobble Hill, B.C.,
Vancouver Island.

PLANTS AND PROBLEMS—XLV

GREENHOUSE RED SPIDER

Question. Many of the plants in my greenhouse have a very sickly appearance and are not growing well. Most of the leaves are yellowish and some appear to be tied up by webbing. Would you please diagnose the trouble and recommend control measures.

Answer. The specimen leaves sent show a severe infestation of the Greenhouse Red Spider, *Tetranychus telarius*. These mites attack a large variety of greenhouse plants and may also occur out of doors on herbaceous plants and weeds.

Both the mites and their eggs can be seen on the undersides of the leaves by means of a magnifying glass but an infestation can also be recognized with the naked eye by the appearance of tiny pale areas on the upper surfaces of the leaves. These spots, caused by the sucking of sap by the mites, increase in number so that the leaves become covered with fine yellowish speckling and eventually wilt. Flowers and fruit may also be attacked and plant growth may become stunted. In severe infestations webbing is found on the leaves and shoots, often interfering with normal growth. This is spun by the young mites as they move from one part of the plant to another.

There are a number of sprays which can be used to destroy this pest. These include Derris, White Oil, P.C.P.B.S., Chlorbenside, and H.E.T.P., but since some of these are harmful to a number of plants the manufacturer's label should be read carefully and an acaricide chosen which is suitable for the range of plants to be treated. In general Derris is least likely to cause injury and the plants should be sprayed two or three times at weekly intervals, directing the spray to the undersides of the leaves. As an alternative to spraying an Azobenzene smoke may be used, two treatments being necessary with an interval of 5–10 days. Here again the manufacturer's recommendations should be read carefully as a number of plants are sensitive to this chemical. As a general rule, Azobenzene should not be used on plants dry at the roots. Both spraying and fumigation should be carried out in dull weather or in the evening to avoid scorch injury to tender shoots and leaves. To prevent a recurrence of the pest all weeds and other plants should be removed from the vicinity of the greenhouse or, if this is not possible, these should be sprayed. A moist greenhouse atmosphere maintained by regular spraying with water keeps the mite in check since they spread most rapidly under hot, dry conditions.

ERRATUM

Cyclamen libanoticum. R.H.S. JOURNAL, Vol. **83**, July 1958, Fig. 92. The pan of *Cyclamen libanoticum* figured here received an F.C.C. and a Certificate of Cultural Commendation, but was not awarded the Farrer Memorial Medal, which was given at the Alpine Garden Society's Show on April 1, to a pan of the same plant shown by Mrs. Greenshields of Epsom.

The contents of this volume are copyright. For permission to reproduce any of the articles application should be made to the Council.

ROSES

By F. FAIRBROTHER

THIS is the first volume of the new series of Penguin Handbooks prepared in collaboration between The Royal Horticultural Society and Penguin Books. It is a practical handbook for all who would like to grow roses and contains plans for rose gardens, details of preparing the soil, planting, cultivation, pruning, propagating and preparing roses for show as well as a fascinating chapter on the history of the present cultivated roses. There are descriptions of shrub roses and a selected list of the author's recommendations for Hybrid Tea, Floribunda and Climbing Roses. Mr. Fairbrother writes with authority, having grown roses since boyhood and now being a Deputy President of the National Rose Society.

This series is intended for all those starting a small garden for the first time as well as for those who are more experienced and, like *The Vegetable Garden Displayed* and *The Fruit Garden Displayed*, aims at showing the operations necessary through pictures of their being carried out by experts. The Series will be very freely illustrated.

Now ready. Price 5*s*., postage and packing 9*d*.

'*At the price you could not have better value . . . (Mr. Fairbrother) has the gift of passing on his knowledge in the most practical way. . . . The rose-grower will find everything he wants in this Penguin on Roses, and we may look forward to many more titles to follow in this series.*'

(V. Sackville-West in *The Observer*.)

Next volume to be published in the late autumn:

Annuals and Biennials, by A. P. BALFOUR, V.M.H.

Obtainable from

THE SECRETARY

THE ROYAL HORTICULTURAL SOCIETY

Vincent Square, London, S.W.1

It's a matter of Taste

SAYS–

FRED STREETER

WORLD FAMOUS BBC OFFICIAL GARDENER

Do you remember how Tomatoes used to taste? More flavour somehow . . . real Tomato flavour . . . delicious!

If you grow Tomatoes you can now have an abundance of full-flavoured, sweet juicy fruits rich in colour and much earlier by feeding with

THE NEW TOMATAB

TOMATO TABLETS

HERE'S WHY

This new formula has lots of Potash for sturdy growth and to make the fruit sweet and delicious. Manganese, Iron, Calcium and Magnesium for colour and disease resistance with abundant Phosphates for early maturity, but NO Nitrogen because this, I consider, makes for coarse fruit, tall sappy growth and delay in ripening.

My Tomato Tablets will give you plentiful crops of earlier ripening, fine textured Tomatoes with a truly delicious flavour and vivid colour. I know you're going to like them.

Fred Streeter

144 Tablet Carton 2/3 — **1,000 Tablet Drum 9/–**

Obtainable from all Plantoids Dealers
In case of difficulty write to

PLANTOIDS LTD.
BROMLEY, KENT

grow much nicer Tomatoes!

Printed by Spottiswoode, Ballantyne & Co. Ltd., London and Colchester